MINING WORLD

In this Issue

Bradley Exploration at Ima

Page 34

FEBRUARY 1952

Vol. 14 No. 2

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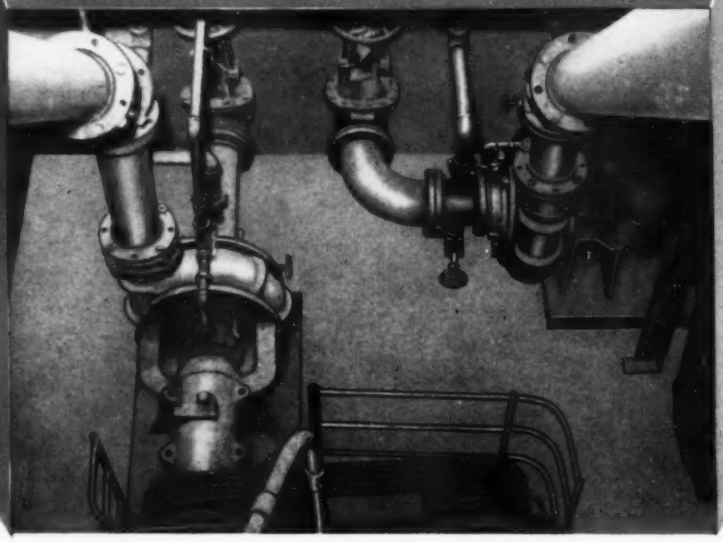
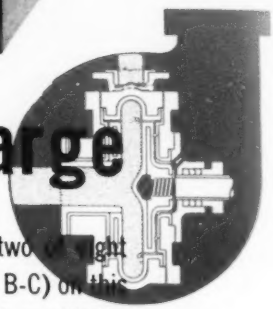
A better way



Two Hydroseal Sand Pumps in the plant of a major copper producer in the Southwest.

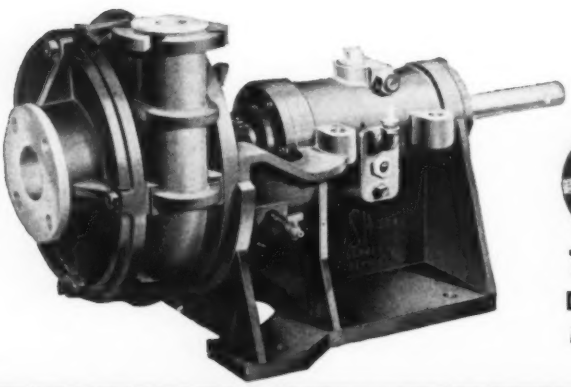
to handle ball-mill discharge



It's not conventional to handle ball-mill discharge with pumps, but that's the way it's being done in this southwestern plant of one of America's largest copper producers. A long series of tests convinced the mill engineers that a Hydroseal Pumping System was far superior to a bucket elevator for this job. Not only did it cost much less to install, but maintenance costs were greatly reduced.

The illustration above shows two of eight Hydroseal Sand Pumps (Frame B-C) on this service. One pump is in operation, with the other a standby. Each pump can handle the discharge at the rate of approximately 5500 tons of solids per day, the mixture containing 65% solids by weight. Some of the material is plus 10 mesh, with 64% being plus 100 mesh and 28% minus 200 mesh.

Hydroseal engineering may be able to save money in your mill through more efficient abrasives handling.



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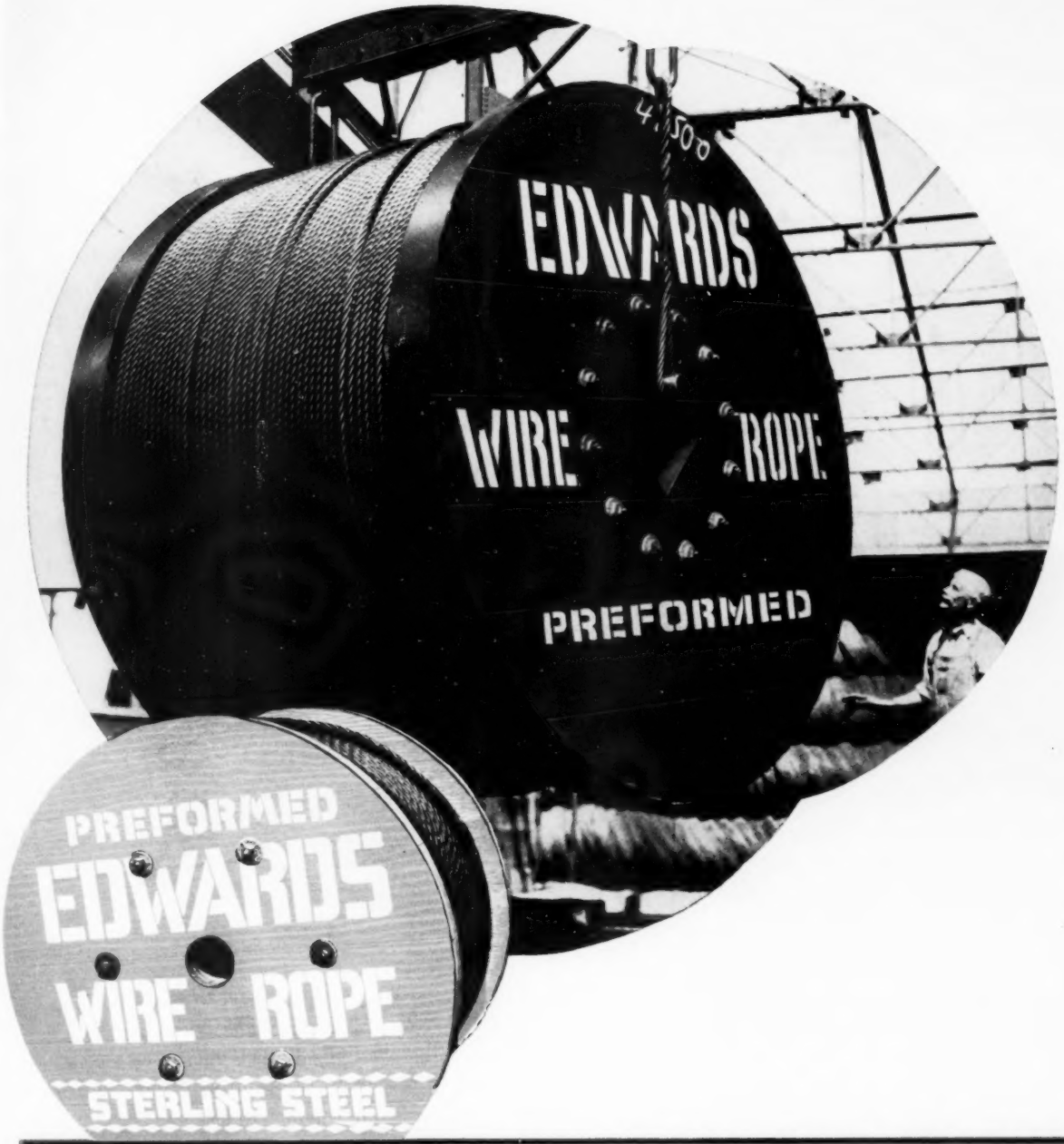

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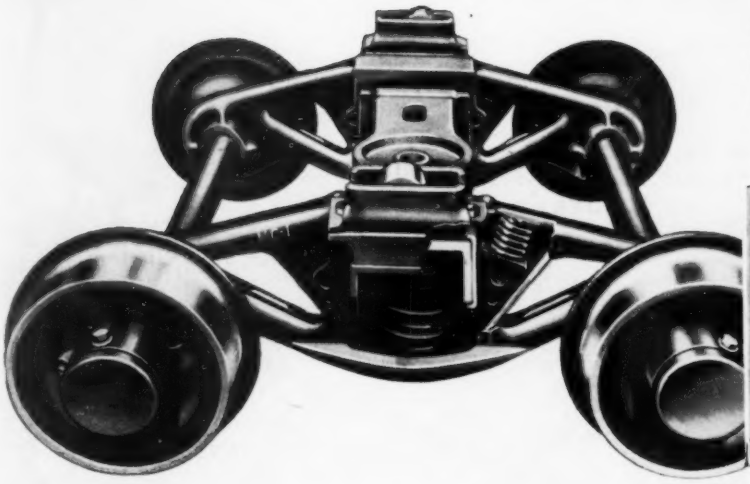
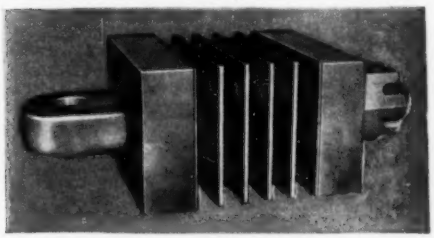


The NC-1 Truck climaxes 20 years of intensive research, providing (through the friction control mechanism shown in cutaway) protection to equipment, roadbed and lading with maximum wear life.

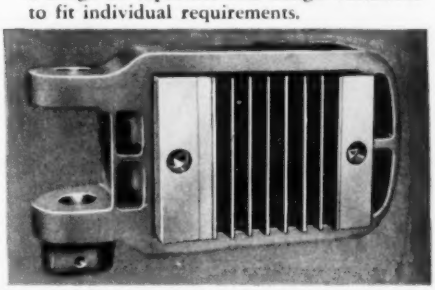
Willison Automatic Couplers save time with maximum safety . . . can be coupled at either end of car or locomotive . . . require no manual assistance. Close coupling eliminates damaging slack, permits high speeds with maximum stability.

NATIONAL *products cut per ton costs!*

Latest example of National's pioneering in better equipment is the NC-1 Truck. Its sweeping advancements over conventional trucks include long soft springs, a friction mechanism—controlling vertical and transverse oscillations, a cast one-piece bolster with large lubricated center connection, and automatic frame alignment. The NC-1 has been designed with the same factor of safety that is required by the Association of American Railroads for full size railroad trucks, and embodies the same features which A.A.R. tests have shown to be essential to produce good riding qualities. For the best in profitable equipment, *always specify National products.*



National M-230 Rubber-Cushioned Draft Gear for cars operating through rotary dump. Soft initial-action, high-capacity rubber pads provide maximum impact protection, lengthen equipment life. Available in a range of capacities and design variations to fit individual requirements.



M-225 Rubber-Cushioned Draft Gear for locomotives and large capacity cars not required to operate through rotary dump. Maximum protection in minimum space.

A-3863

NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

WILLISON AUTOMATIC COUPLERS • NC-1 TRUCKS • DRAFT GEARS • NACO STEEL WHEELS

NATIONAL Products FOR TRANSPORTATION AND INDUSTRY Est. 1868

Miners do more and like it!

. . . with easy-to-handle Le Roi-CLEVELAND 2-way air-feed sinker drills

Men get less tired!
Safety records improve!
Tonnages rise!

TAKE the hardest part of the work out of drilling and speed it up, too. Equip your miners with Le Roi-CLEVELAND HC10 Air-feed Sinker Drills — then watch tonnages per man-shift go up.

A lightweight column — pneumatic- or screw-type — supports the HC10. Setting-up takes only a few minutes. Feeding is done by air-pressure. All controls are handy.

Quick reverse feed makes it quick and easy to change steels. There are no swing or dump nuts to loosen or tighten.

The fast, light blows of Le Roi-CLEVELAND Air-Feed Sinker Drills are just right for carbide bits. You get maximum bit life — can use smaller bits for higher drilling speeds.

In addition to the popular HC10 model with 45-lb. drill, Le Roi-CLEVELAND Air-feed Sinker Drills are available in an HC23 model with 3⅛" bore. Both models help your miners produce more footage and greater tonnages. And because the men don't get so tired, safety records improve.

Write today for complete information.

LE ROI COMPANY

RD-44

CLEVELAND ROCK DRILL DIVISION
12500 Berea Road, Cleveland 11, Ohio
***Plants:* Milwaukee, Cleveland and Greenwich, Ohio**

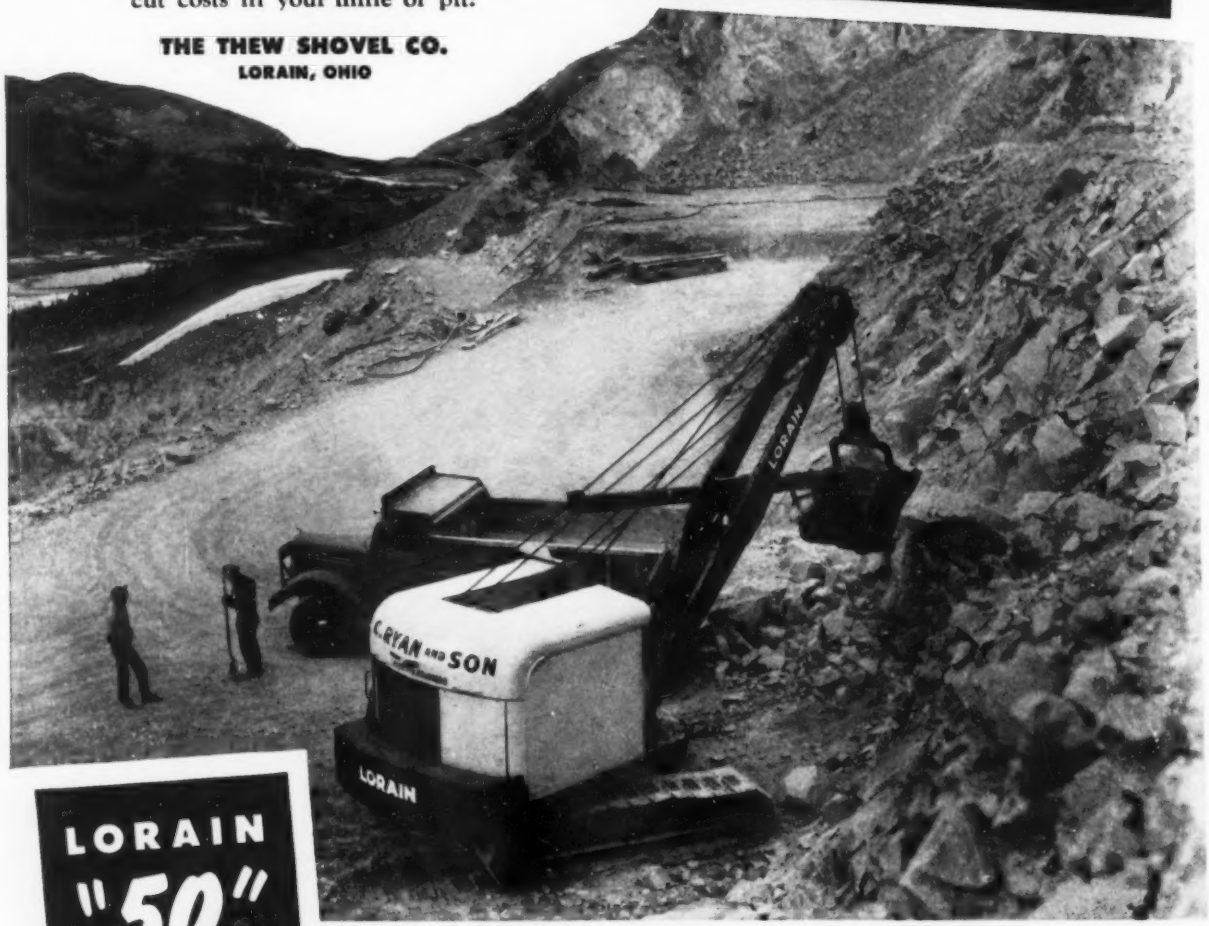
World's Largest Molybdenum Mine

is the striking setting for this new Lorain 50-I shovel. This Climax, Colorado pit produces 90% of the world's supply of molybdenum, so vital in today's production of steels.

Tough rock digging — and lots of it — is a specialty of this 1-yard Lorain-50 because it is equipped with a shock-absorbing, hydraulic (fluid) coupling that offers many advantages for easy operation, increased production and longer life. It is the only 1-yd. shovel available with this feature as standard equipment! The Lorain-50 story is worth checking with your Thew-Lorain Distributor — to boost production and cut costs in your mine or pit!

LORAIN "50" WITH HYDRAULIC COUPLING LICKS ROUGH-TOUGH DIGGING at Climax, Colorado Pit

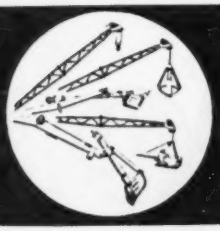
THE THEW SHOVEL CO.
LORAIN, OHIO



LORAIN "50" FEATURES

- *Hydraulic Coupling Power Take-Off* — digging power "hangs on"— cushions shocks
- *One-Piece Cast Steel Turntable Bed* — extra strength; revolves on anti-friction bearings
- *Air Controls for Steering and Tread Lock* — from operator's cab in any swing position
- *Choice of 6 Mountings* — 3 crawler lengths in 2 widths; also on rubber-tires

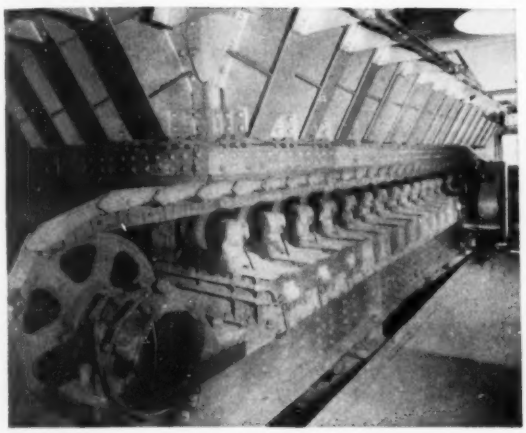
THEW LORAIN® on CRAWLER or RUBBER



SHOVELS
CRANES
DRAGLINES
CLAMSHELLS
HOES

Plenty of Roughage in this Diet . . .

as S-A Pan Feeders handle ore up to 3000 tons per hour



CRUSHING PLANT

Rail cars dump ore from nearby open pit mines into receiving hoppers. Four AMSCO Manganese Steel Pan Feeders, mounted thirty feet below, have a combined capacity of 3000 tons per hour. Each feeder is 72" wide by 27' long. Ore moves in a measured flow from the dump hoppers to scalping screens and then to the crushing plant.

• S-A Manganese Steel Pan Feeders have the stamina to withstand the endless punishment of thousands of tons of ore dumped onto them hour after hour, day in and day out. They assure uninterrupted flow of materials to the scalping screens—in uniform volume without under or overloading conveyors.

AMSCO* manganese steel construction and S-A design combine to produce a unit which is incredibly sturdy—highly resistant to wear and abrasion. That means dependable service for many years *with minimum maintenance and spells low cost per ton operation.*

For fifty years S-A engineering has met and solved the toughest problems in bulk materials handling. Whether you plan to install new equipment, or enlarge your present set-up, you will benefit by the recommendations of S-A engineers. Write us.

*T. M. Reg. American Brake Shoe Co.

1901-1951

50 years experience **STEPHEN S-A ADAMSON** *with bulk handling*

MFG. CO.

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DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

MECHANIZATION in BIRMINGHAM MINES

(Just as in mining areas <u>everywhere</u>)

IS BUILT AROUND EFFICIENT, FIELD-PROVED

JOY LOADERS, SHUTTLE CARS and DRILLMOBILES

When mining engineers in the Birmingham district saw the need for mechanized methods to decrease costs and increase profits, they turned to Joy for their equipment answers. The Joy 18-HR-1 Loader and 60-E Shuttle Car, hard-rock versions of Joy's successful coal-loading teams, furnished the necessary speed and capacity for high-production loading and haulage.

A later refinement of the loader, the Joy 18-HR-2, is now being used extensively in the area. Its 12-ton-per-minute loading capacity permits the fastest possible movement of ore from the face. Like the loader, the Joy 60-E Shuttle Car is specially designed for the rugged duty of ore and rock handling with a minimum of maintenance.

Another machine helping to reduce costs in Birmingham mines and other mining areas is the rubber-tired Joy Drillmobile. It moves in and out fast, sets up quickly, assures drilling your rounds in minimum time and at least cost per foot of hole. ● Let us help you apply Joy Equipment to *your* conditions.

Have You seen this film?

"HARD ROCK MECHANIZED MINING"

in Sound and Full Color

★

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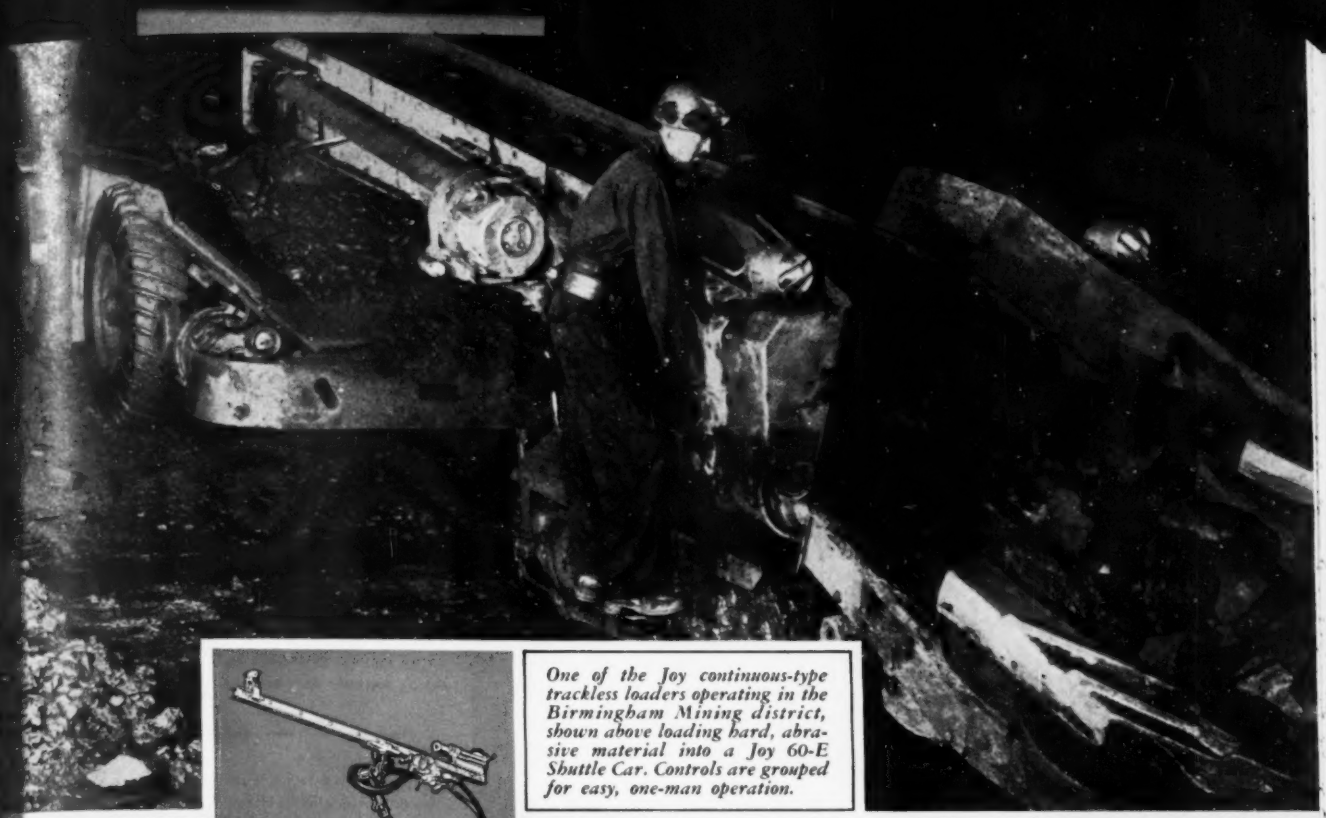
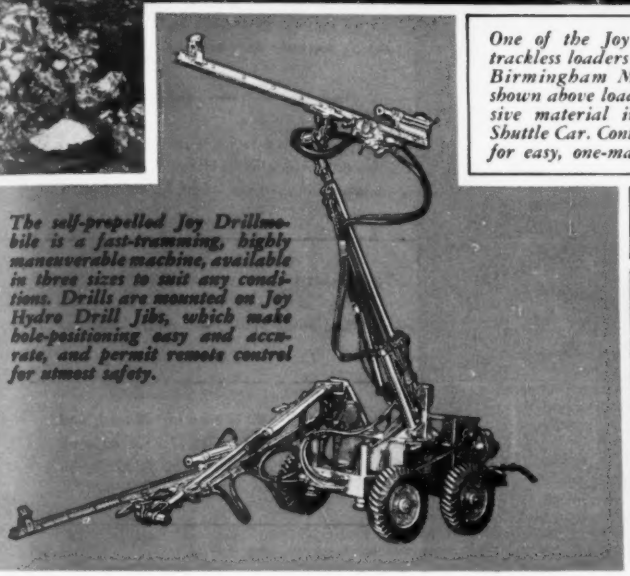
Address: Film Booking Dept.

JOY MANUFACTURING COMPANY
Oliver Bldg., Pittsburgh 22. Pa.

World's Largest Manufacturers of Underground Mining Equipment



One of the Joy continuous-type trackless loaders operating in the Birmingham Mining district, shown above loading hard, abrasive material into a Joy 60-E Shuttle Car. Controls are grouped for easy, one-man operation.



The self-propelled Joy Drillmobile is a fast-tramming, highly maneuverable machine, available in three sizes to suit any conditions. Drills are mounted on Joy Hydro Drill Jibs, which make hole-positioning easy and accurate, and permit remote control for utmost safety.

The 60-E, below, is a cable-reel operated car, easily handled and highly maneuverable.

Other JOY EQUIPMENT used in the BIRMINGHAM DISTRICT

STATIONARY AND SEMI-PORTABLE AIR COMPRESSORS—Models to deliver from 1.6 to 3656 C.F.M.

MINE-AIR COMPRESSORS—Self-propelled or draw-bar models in capacities from 130 to 240 C.F.M.

ROOF BOLTING STOPERS—Specially designed for roof bolting under most mining conditions.

CONTINUOUS MINERS—For efficient, low-cost mining in high or low coal.

TRACKLESS COAL CUTTING MACHINES—Rubber-tired, self-propelled universal cutters for all needs.

LOADING MACHINES FOR COAL—High capacity continuous-type loaders in models for all seam thicknesses.

SHUTTLE CARS FOR COAL—Easily-handled, highly maneuverable units for high capacity haulage.

CHAIN CONVEYORS—Compact and efficient, designed for long and continuous service with minimum maintenance.

SHAKER CONVEYORS—Compact sections with "Cushion Stroke" drive to handle any room and entry conditions.

Consult a Joy Engineer

WRITE FOR COMPLETE INFORMATION ON ANY OF THE ABOVE EQUIPMENT

W&D M3365

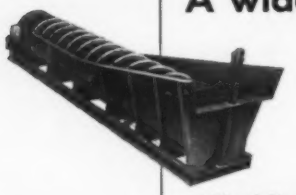
JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

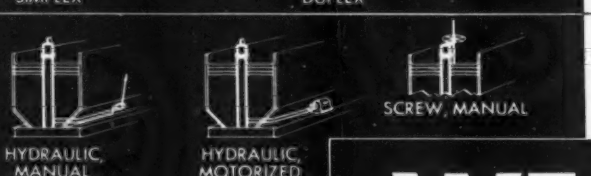
WEMCO S-H CLASSIFIERS

A wider choice to better suit your job



Lower initial cost, lower operating cost, and sharper separations—these are the advantages of selecting the right diameter, length, depth, tank design, and details for **your particular material and operating conditions.** Only the WEMCO S-H Classifier offers such a wide selection—and WEMCO's metallurgical staff is ready to aid you in applying the correct unit.

The following table shows a partial breakdown of more than 2,000 standard WEMCO Classifier models:

OPTION	DESCRIPTION	REMARKS
1 SPIRAL DIAMETERS		A right diameter for every job, giving better balance between sand conveyance and pool area requirements.
2 SPIRAL PITCH		"S-H" (Special Helix) advanced pitch design on all models, giving up to 100% greater raking capacity compared to other designs.
3 SPIRAL LENGTH		Length furnished to fit exact needs of each job—correct lengths for closed circuiting—adequate drainage deck length for dewatering.
4 TANK STYLE		Tank styles to fit the characteristics of the material and the separation to be made—up to 25% greater "effective" pool area than other units.
5 POOL DEPTH		Generally Series 90 is used for 48 mesh and coarser separations, Series 125 for 48 mesh to 150, and Series 150 for 100 to 325 mesh separation.
6 ASSEMBLIES		Duplex units give nearly double the capacity of simplex units, but require less floor space than two separate units.
7 LIFTING DEVICE		Smooth, powerful hydraulic action is usually preferred to the older style screw lift.

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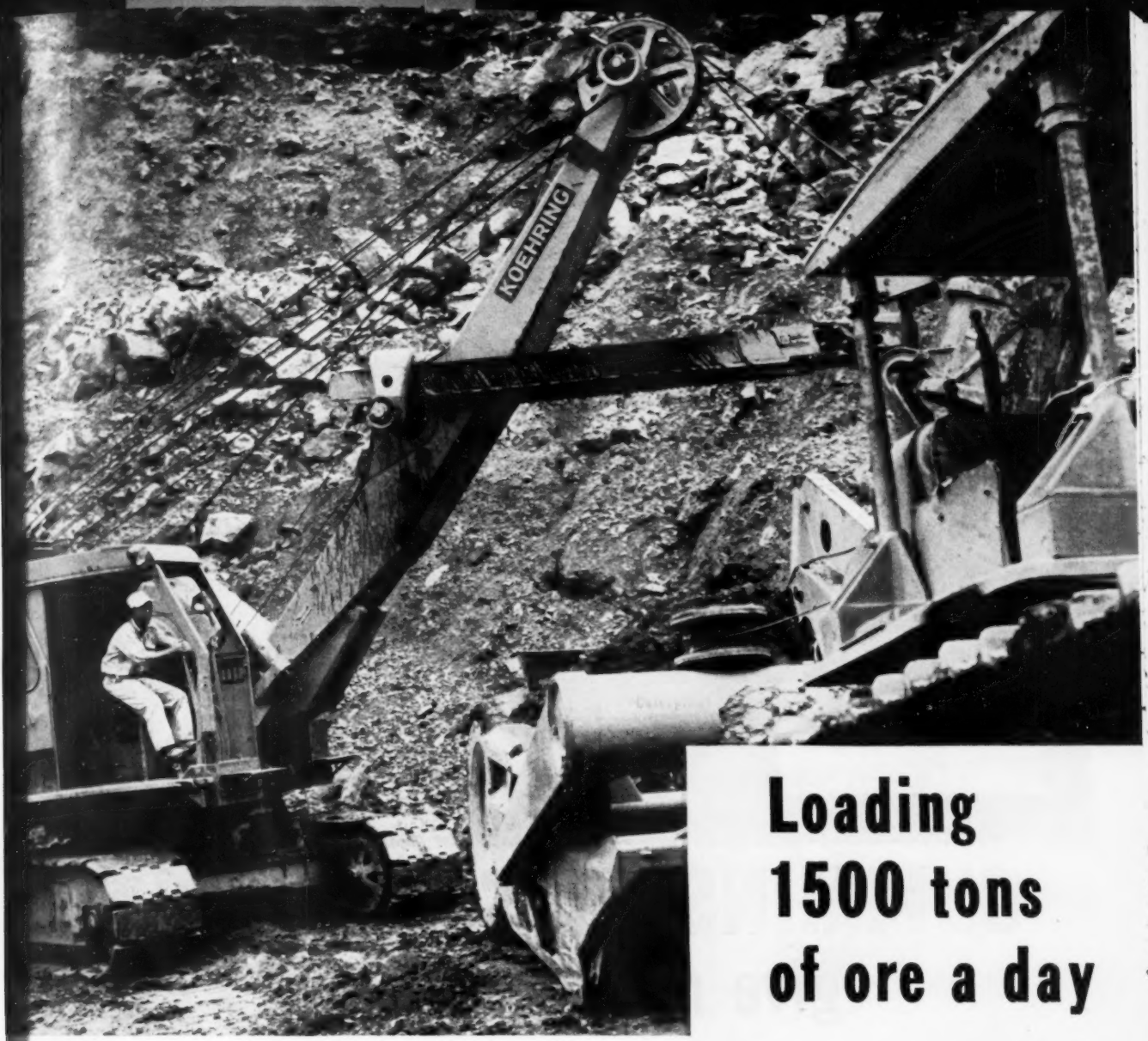
- Lilestone & Co., Inc., Manila, Philippines

WEMCO
WESTERN MACHINERY COMPANY
760-766 FOLSOM STREET SAN FRANCISCO 7, CALIFORNIA

MOBIL-MILLS
COAL SPIRALS
HMS THICKENERS
HMS PUMPS
DENSIFIERS
CONE SEPARATORS
DRUM SEPARATORS
FAGERGREN & STEFFENSEN FLOTATION MACHINES
FAGERGREN LABORATORY UNITS
HYDROSEPARATORS
HMS LABORATORY UNITS
DEWATERING SPIRALS
AGITATORS
SH CLASSIFIERS
THICKENERS
SAND PUMPS
CONDITIONERS



Loading 1500 tons of ore a day

THERE'S an interesting mining development in progress north of Joplin, Missouri. Potter and Sims are making a profit out of stripping lead and zinc ore by open-pit methods.

In an area where earlier shafts had been "mined out" they are finding enough ore in veins near the surface to make a real contribution to the supply of metals needed for defense.

At a pit depth of 120 feet, a Koehring 1½-yard shovel, powered by a "Cat" Diesel D13000 Engine, is used to load "Caterpillar" Scrapers, pulled by D8 Tractors. Daily delivery to the mill totals over 1,500 tons of ore-bearing earth.

Dependable "Caterpillar" Diesel Engines are the overwhelming choice of manufacturers who build shovels, compressors and other powered equipment. Tough, simple and easy to operate, these engines have a reputation for standing up on the job and making money for owners.

Right now it's more important than ever to take good care of all your equipment. Proper lubrication and mechanical attention take only a few minutes a day, but they pay big profits in long, trouble-free work life. And when repairs are needed, you can count on your "Caterpillar" Dealer for prompt, efficient service.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

CATERPILLAR TRACTOR CO., San Leandro, Calif.; Peoria, Ill.

GRAB SAMPLES From the Mail

Mining Industry Praises "Iron Ore Outlook" Issue

The "Iron Ore Outlook" issue has been so widely acclaimed by the entire mining fraternity, and more particularly by iron ore miners everywhere that a few of their comments are reprinted below.—Ed.

Dear Sir:

Your recent issue with particular emphasis on the business of mining iron ore we think was a fine contribution to the industry—exceptionally well done and comprehensive. The last few years have brought many changes and improvements, particularly in the beneficiation of low grade ores. We think you covered this very well and are entitled to the thanks of the industry for such a clear cut picture of what is going on in the Lake Superior District.

Warren S. Moore
W. S. Moore Co.
Duluth, Minnesota

Dear Sir:

I think the October issue especially good, but perhaps not quite as brilliant as the "Iron Ore Quandry" number of September 1947. The latter, however, was mainly speculative while the October issue primarily factual.

R. B. Aitchison
Linde Air Products Company
New York 17, New York

Dear Sir:

I would like to say—very sincerely—that the October number of *Mining World* is the best single issue of any mining magazine I have ever seen for iron mining coverage. It should be sent to all college mining departments for study and reference. It is not only instructing, but very interestingly written. You and your staff deserve congratulations and commendation for the great amount of fruitful work you have put into it.

I have heard very favorable comments from mining men here on the Mesabi Range and am sure it will be well received everywhere.

E. S. Tillinghast
Hibbing, Minnesota

Dear Sir:

I have just finished reading the Iron Edition of *Mining World* and was much impressed with the wealth of information covered in the excellent articles.

The edition is very complete and the data well presented so that it represents a fine reference for information on the iron ore and steel industry. In this connection, I am ordering additional copies for a rather wide distribution to our interested key people.

The corporation was glad for the opportunity to cooperate with your people in the development of this fine timely edition and I personally congratulate you for a real job well done.

C. C. Henning
General Manager of Raw Materials
Jones & Laughlin Steel Corporation
Pittsburgh 30, Pennsylvania

Dear Sir:

The October issue seems to be an excellent and comprehensive story of the iron ore outlook.

In as much as we have contact with many contracting representatives who have no connection with management of the company we would appreciate your forwarding 20 additional copies for which we enclose $7.00.

V. D. Johnston
Oglebay, Norton and Company
Cleveland 15, Ohio

Increase PRODUCTION . . .


Highway relocation in Oregon


Hauling overburden in New Tazewell, Tenn. quarry

1 ***Haul anywhere*** . . . Tournarocker is a new kind of haul unit built from the ground up for "off-road" hauling. It safely travels mountain trails and cross-country as well as highways and city streets. It hauls capacity loads over any kind of terrain. And, it stands up to tough, rough hauling work on steep grades with minimum maintenance. Optional Electrotarder provides added braking action for safety on steep grades.

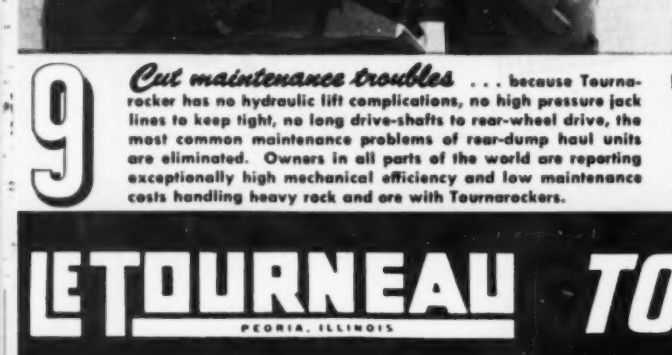
2 ***Speed loading*** . . . Big, wide "target" areas make it easy for shovel or dragline operators to get faster loading cycles with Tournarockers. Body opening on 9-ton size is 7′ x 11′, on 18-ton is 9½′ x 12½′, on 50-ton is 13′ x 17′. Width is most important because radial distance is hard for operator to judge. Rear of body provides a wide, low entry for the dipper to give extra speed advantage for the excavator.

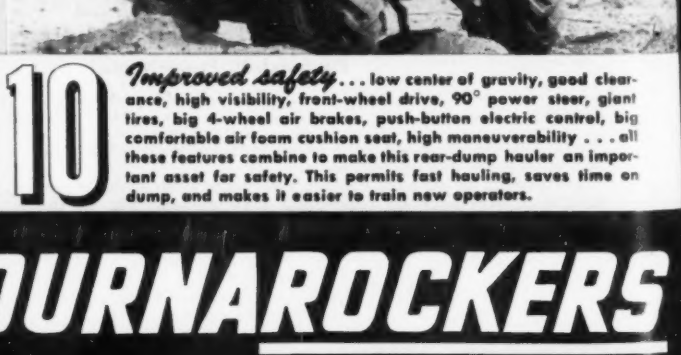

Dumping sandstone near New Haven, Conn.


Highway construction at Seattle, Wash.

5 ***Reduce time dumping*** . . . a touch of electric switch on operator's panel activates hoist motor . . . means a fast, safe dump. Independent brakes on front and rear allow operator to safely back to edge of fill . . . lock rear wheels and dump over edge . . . yet keep prime mover in forward gear for safety and fast getaway. There is no delay for hydraulic pressure to build up, no slow jacking up by hydraulic pumps. Loads fall free and FAST!

6 ***Cleans load every time*** . . . even in mud and sticky clay, Tournarocker dumps clean. The streamlined body sheds material readily . . . body can be raised to vertical position to clear load . . . no material rides back to the excavator to steal pay-load room on next trip. Large boulders or oversize rock easily clear and can safely be dumped over edge of fill. Rocks cannot roll forward against wheels nor can material pile under rear end.


Stripping quarry rock near Phoenix, Ariz.


Stripping coal mine at Mt. Carmel, Pa.

9 ***Cut maintenance troubles*** . . . because Tournarocker has no hydraulic lift complications, no high pressure jack lines to keep tight, no long drive-shafts to rear-wheel drive, the most common maintenance problems of rear-dump haul units are eliminated. Owners in all parts of the world are reporting exceptionally high mechanical efficiency and low maintenance costs handling heavy rock and ore with Tournarockers.

10 ***Improved safety*** . . . low center of gravity, good clearance, high visibility, front-wheel drive, 90° power steer, giant tires, big 4-wheel air brakes, push-button electric control, big comfortable air foam cushion seat, high maneuverability . . . all these features combine to make this rear-dump hauler an important asset for safety. This permits fast hauling, saves time on dump, and makes it easier to train new operators.

LETOURNEAU TOURNAROCKERS

PEORIA, ILLINOIS

TRACTION ADVANTAGES of A CRAWLER PLUS HIGH-SPEED on RUBBER

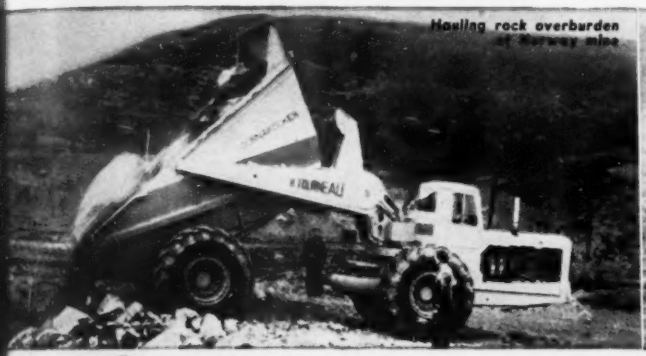
Simplify JOB MANAGEMENT

Road construction between Mexicali and Tecate, Mexico

Mountainside road relocation near Wenatchee, Wash.

3 ***Cut spotting delays*** . . . You need fewer "spots" with these BIG haul units, and, because of their big tops, it is easier and quicker to put them under the dipper. The prime mover can pivot at right angles to the body providing a 90° angle for prime mover wheels. That saves time at every spot. Operator can back in fast because he has positive power steer and can stop instantly with air-operated multi-disc air brakes.

4 ***Work fast in tight quarters*** . . . positive power steer, 90° turns, electric controls, multi-disc air brakes that have more braking surface on a single wheel than most haul units have on all four wheels . . . all contribute to fast handling over steep, narrow, winding pit roads. Giant tires roll easily over rough surfaces, steer easily out of ruts, give operator confidence under the most difficult hauling conditions.



Hauling rock overburden at Norway mine

Hauling clay for Painesville, Ohio cement plant

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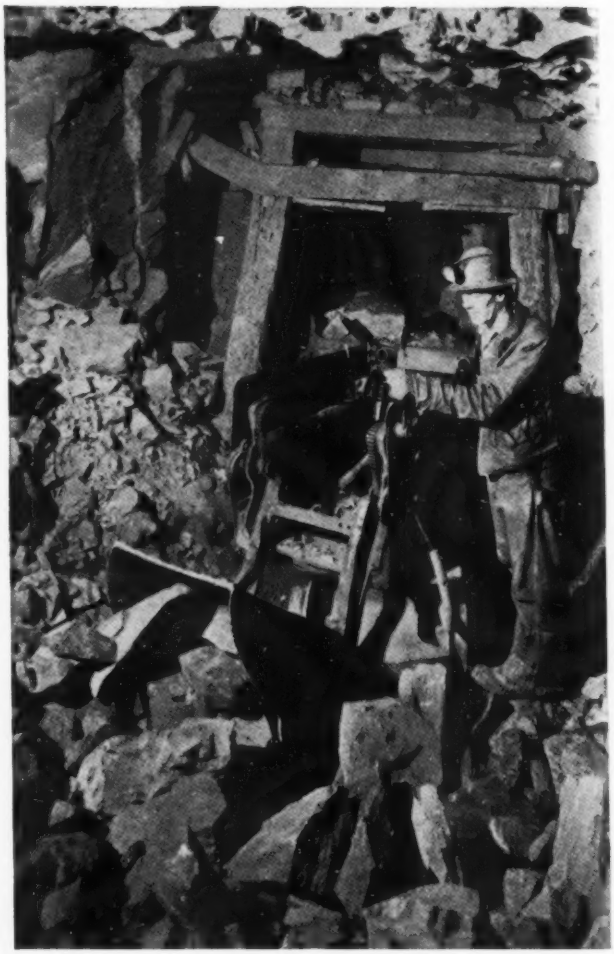

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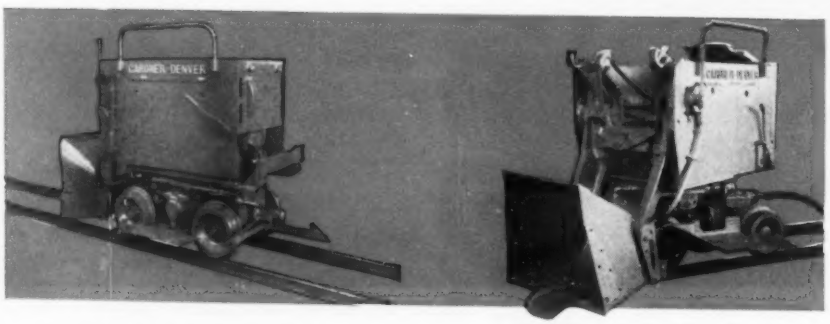

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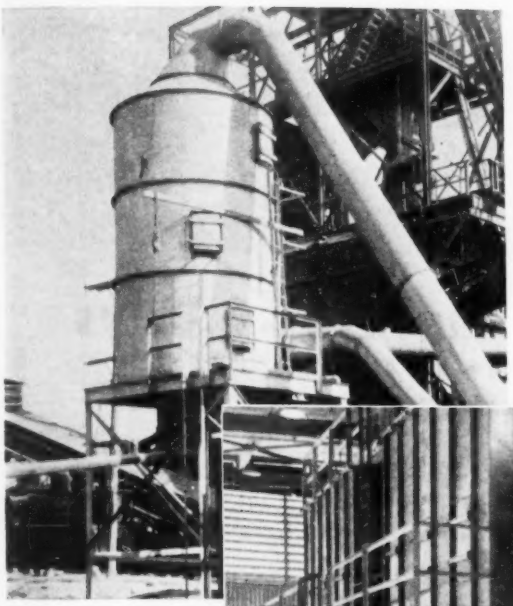

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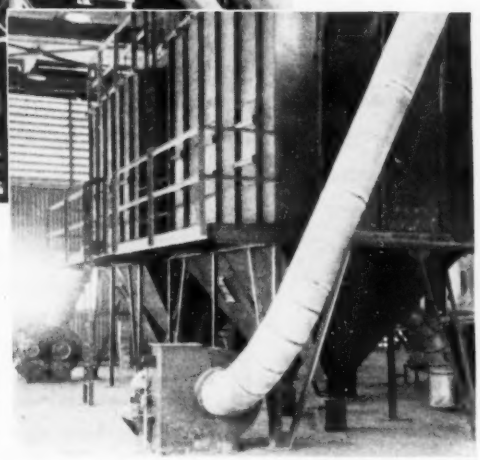
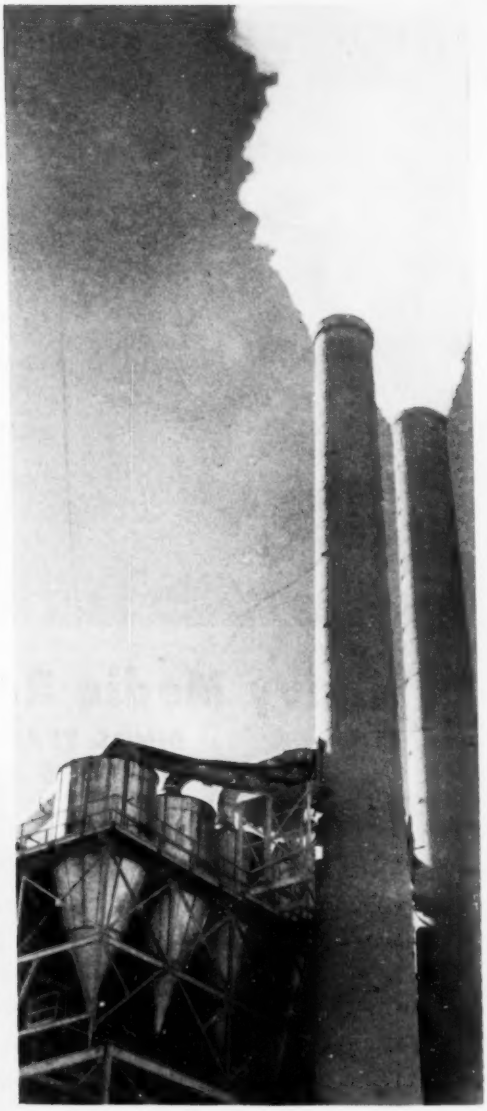


Automatic Bag Type



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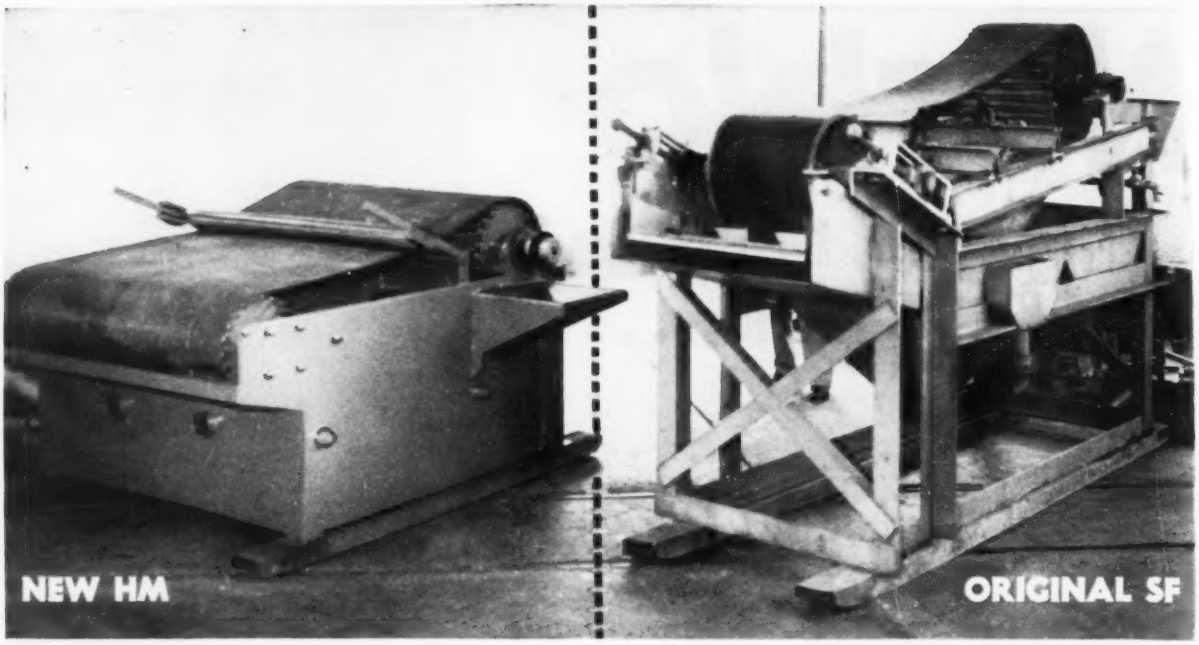

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Co-authored by K. A. Blind of Dings and J. J. Bean of American Cyanamid, this 9-pg. paper will be of considerable help to anyone interested in the potentials of the Heavy Media Process. Write:

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MINING WORLD

and the export edition

WORLD MINING

A Miller Freeman Publication

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SAMPLE LOCATIONS

Capitol Concentrates 23
International Panorama 25
Teekay Mines, Inc. Mines California Manganese 26
Mount Isa Conditions Flotation Feed 31
How Bradley Mining Company Found Tungsten At Ima 34
Report from Mexico 38
English Dragline Strips Iron Ore 40
Chief Consolidated's New Pumping Plant 41
Uranium Miners use Shuttle Carts 43
The Black Maverick Mine—by John D. Mitchell ... 45
Activities of U. S. Mining Men 47
Activities of International Mining Men 49
Production Equipment Preview 71
Metal & Mineral Market Prices 97

COVER CIRCLE: Contract diamond drilling from the steep southern slope of the Ima Canyon was a part of the successful exploration program of the Bradley Mining Co. at their Ima properties near Patterson, Idaho.

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DRIFTS AND CROSSCUTS

Why Can't This Happen in the U.S.A.?

Gold miners and ex-gold miners in the United States have watched the relaxation of the ban on the sale of non-monetary gold by the International Monetary Fund with great hope—hope that the United States Government would give them equal opportunity with that given other gold miners by their governments. It will be remembered that when the Fund lifted its ban on non-monetary sales on September 28, 1951, it left to the 50 member nations what percentage of gold production could be sold at "free market" prices.

Through the cooperation of the Tanganyika Mining Association and its officers and members, *Mining World* has the opportunity of outlining the implementing steps taken by the government of Tanganyika Territory, Africa, to establish "free market" sales of gold. Subsequent steps taken by the Association and bullion dealers to market this gold are also given in chronological order below.

"I am directed to inform you that a dispatch has been received from the Secretary of State indicating the conditions on which locally mined gold may, for the time being, be offered for sale in the "free market:" They are:

(a) the amount so offered may not exceed 40 percent of production;
(b) the gold must be in processed or semiprocessed form and not in bars or coin;
(c) sales may be made only against payment in dollars. This applies to any premium that may be obtained as well as to the basic price of $35.00 an ounce; and
(d) affidavits are required that the buyer has a valid import license into the country of final destination and that the gold is required for professional, industrial or artistic uses."

Signed: Chief Inspector of Mines
October 16, 1951.

On October 16th, officers of the Association met with the government Member for Lands and Mines and the following was determined:

1. Any producer who can comply with the conditions a, b, c, and d above may sell 40 percent of his output in the "free market" immediately.
2. Government will agree to sales through an authorized bullion broker.
3. Government takes the view that it is up to the producers to find suitable channels for gold sales. The Association will endeavor to do so.
4. The conditions under which Tanganyika gold may be sold on the "free market" are still capable of modification. As they stand at present they would appear to be equivalent to the conditions under which the Union of South Africa has been selling on the "free market" for the last two years, and before there was any change of attitude on the part of the International Monetary Fund.

The Association acted at once and established contact with various gold buyers who reported their methods of purchase as follows:

The First By a Letter Dated October 22, 1951.

"We confirm that we are preparing to act as agents for the gold producers in East Africa in the refining, manufacturing, and disposal of gold at premium prices against payment in

Continued on Page 22

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Weight — 23,000 lb.
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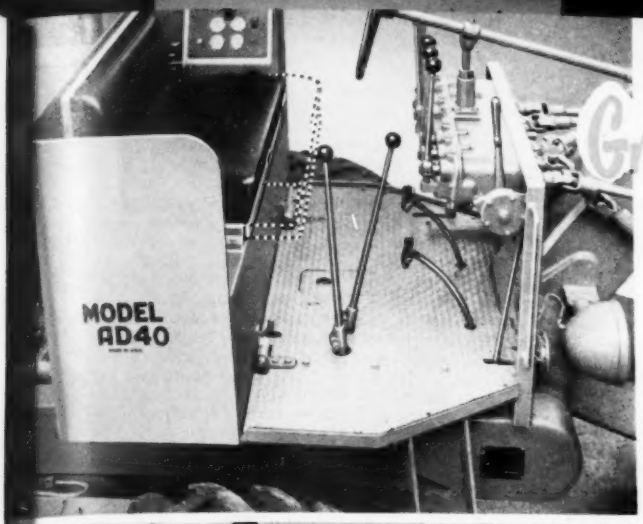
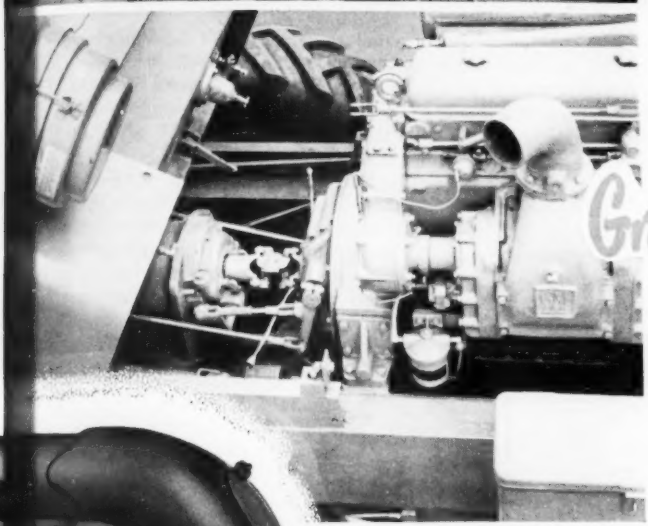
Built to handle All Jobs — FASTER, EASIER





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Here's maintenance and repair accessibility second to none. Combined fuel tank and seat unit tilts forward for easy access to clutch, transmission and drive shaft. Transmission can be removed without disturbing floor plates. Power take-off and hydraulic pump are mounted outside the dash.

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TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

• Designed for Your Job • Built to Take It • Easy to Operate • Easy to Service

Continued from Page 19

United States dollars. Permission to act as agents in this respect has already been obtained from the Bank of England, subject to conformity with the regulations laid down by the Colonial Governments for the sale of gold.

"In calculating the approximate cost of selling 40 percent of the gold output in manufactured form, we have provided for the conversion of the gold into fully manufactured gold articles which are suitable for sale in various foreign markets. The refinery is equipped to deal with the refining of the gold and the manufacturing of the articles, and we have experience of marketing such articles abroad.

"As regards refining, you will recall that prior to the 1939 war it was customary for gold from East Africa to be sent to London for refining and realization, and we suggest that a convenient method of disposal of all gold would be to revert to the pre-war practice. In that event, gold destined for the Bank of England could be delivered, and the appropriate quota of gold for premium sales could be retained for that purpose. This would require prior arrangement with the Bank of England, and if you are interested, we are prepared to consult the Bank.

"We estimate that in respect of premium gold sales the total cost to the gold producers from Dar es Salam, Tanganyika airport is about 7/6d ($1.07) per fine ounce, including inter-alia:

1. The cost of air freight and insurance from Dar es Salam to London.
2. Refining charges.
3. Manufacturing and packaging charges.
4. The cost of freight and insurance of gold sold on the continent (European).
5. The commission charged by authorized foreign exchange dealers for the realization of United States dollars, and our commission for realization.

"The above charges have been calculated at current rates, and any variation must be passed on to the gold producers.

"We further confirm that we are prepared for the time being to finance the shipments of gold up to 95 percent of the value at the London office price of gold, if desired, from the point of departure at a rate of interest equal to 1.0 percent over Bank rate minimum 3.0 percent, subject, of course, to approval being obtained from the Bank of England, and subject also to satisfactory guarantees as to the fineness of the gold.

"We now look forward to your reply with interest, and we shall be glad to give any further information which you may require."

Signed: N. M. Rothschild & Son
Royal Mint Refinery
New Court, St. Swithin's Lane
London E. C. 4, England

On October 26th, C. H. Dansey a bullion buyer was in Tanganyika and wrote the following letter:

"I have now received confirmation from London that my firm agrees entirely with the recommendations I have made to you verbally, viz. that in view of the relatively small production of gold in Tanganyika (1951 production from January through September was 49,297 ounces) it is essential that the sales for industrial purposes should be pooled if your producers are to obtain the maximum price.

"Assuming your producers decide to pool in this way, my firm would be prepared to secure the sale each month of the authorized quantity at the same price as is obtained by the Transvaal Chamber of Mines at the beginning of the month. This, as explained, is a highly competitive price fixed in respect of its sales contracts of several hundred thousands ounces as a result of negotiation between the Chamber and the buyers. Your producers would thus have an assured market so long as the present situation where there is a premium market for industrial gold existed.

"Payment would be made against delivery of refined bars to my firm in London. My firm, as authorized bullion dealers, would be responsible for ensuring compliance with all the manufacturing conditions. The cost of manufacture would be borne by the buyers. My firm's services would be free of commission to you.

"The method of payment would of course have to be agreed by your financial authorities. As my firm are also bankers and authorized foreign exchange dealers the normal procedure would be for my firm to surrender the U. S. dollars to the Bank of England and to pay the Sterling proceeds to your producers or their agents.

"Should your producers decide not to accept the arrangement suggested, my firm remains at their disposal for the sale of all or part of the authorized quantity at any time. As pointed out, however, apart from the fact that the best prices are not obtainable for small amounts, without the arrangement in question, sales would be subject to the day-to-day fluctuations of the market and the risk that at any given moment there might be a complete absence of buyers.

"If your producers preferred to consign their production direct to my firm, my firm would be pleased to have the refining carried out at our refiners. This is however not a condition of the offers made above.

"As suggested by you, formal confirmation of these proposals from London will be received by your association by air mail.

"As regards the quantity of gold available for sale in London or in transit, if quick delivery in London can be arranged, my firm will be able to pay your producers the price of U. S. $37.50 per fine ounce. This bid is conditioned upon your being able to cable your reply indicating the approximate quantity involved on Monday next, or at the latest early Tuesday morning."

Signed: C. M. Dansey
Samuel Montague & Co. Ltd.
114, Old Broad Street
London E. C. 2, England

The Tanganyika Association reported on October 29th to its members that "It is considered that producers would obtain a better financial return if their production is pooled and sold to Samuel Montague who would pay under the circumstances the same price as obtained by the Transvaal Chamber of Mines.

"Government will not be a party to the pooling arrangement which must be undertaken through this Association who would be responsible for the distribution of the premium sales among the various producers."

In addition to the two firms mentioned above, the Tanganyika government has authorized the following London bullion brokers to act as agents for the sale of premium gold.

Mocatta & Goldsmid
7, Throgmorton Avenue, E. C. 2

Sharps & Wilkins
19, Great Winchester Street, E. C. 2.

Johnson Matthey & Co. Ltd.
78, Hatton Graden, E. C. 1

Pixley & Abell
Palmerston House, E. C. 2

Signed for the Association: Cooper Brothers, Leslie, Seex & Co. Secretaries.

COMING CONVENTIONS

January 31, February 1 and 2, 1952. Domestic Mining Convention in conjunction with the Annual Convention of the COLORADO MINING ASSOCIATION, Shirley Savoy Hotel, Denver, Colorado.

February 18 through 21, 1952. Annual Meeting of the AIME, Hotel Statler, New York, New York.

February 21, 1952. 25th Annual Mineral Institute Industry Meeting of the University of Washington. University campus, Seattle, Washington.

April 11 and 12, 1952. Western Mountain Section, GEOLOGIC SOCIETY OF AMERICA, University of Arizona, Tucson, Arizona.

April 21 and 22, 1952. Annual Meeting AMERICAN ZINC INSTITUTE, Hotel Statler, St. Louis, Missouri.

April 21 through 23, 1952. Diamond Drilling Symposium arranged by the Chemical, Metallurgical and Mining Society of South Africa and the Diamond Research Laboratory, Johannesburg, Union of South Africa.

September 8 through 15, 1952. XIX Session INTERNATIONAL GEOLOGIC CONGRESS, Alger, Algiers.

CAPITOL CONCENTRATES

Government Mining Announcements Don't Mean What They Sound Like

The public will learn eventually not to believe everything it hears in Governmental Brass Hat speeches, in hand-out press releases, and in announcements of various programs. Nearly every one of these has contained some gimmick, legal obliquity, or down-right mis-statement. All this is not calculated to increase the public confidence in the government.

The original announcements on the tungsten program indicated that the $65.00 price would apply to ore; instead it only applies to concentrates, a very different thing as producers soon discovered. The announcement of the Deming, New Mexico, purchase schedule for manganese had in it an obscure phrase which went unnoticed by the industry until after production had been stimulated; then GSA translated the Sanscrit into good, hard dollar deductions which eliminated most potential shippers.

Announcements of RFC loan approvals, for instance, invariably say, "Each loan is subject to certain conditions and requirement which must be met before funds are disbursed." Any number of loans could be "approved" on such a basis and on such terms that it would be impossible for the applicant to accept the money. A list of actual disbursements would be more honest.

The administrators of these programs are not always at fault. They are torn between facing the mining industry with optimistic statements which reflect the top policy of the President, and the natural conservatism of government employes who are afraid to stick their necks out. This latter characteristic is often carried (particularly by the legal sections) so far as to nullify by agency policy the liberal congressional enactments. Statements are made with the deliberate intention of leaving room for hedging, if not plain welching. The net result is confusion and a muddling sort of action which does not bring results and irritates everyone, including the department heads themselves.

• *Can You Keep Up With Metal Agencies?*

The complexity and overlapping of Federal governmental agencies dealing with mining and metals is ever growing. In this Washington report are the abbreviations or governmental gobbledygook for 15 such agencies—and there are more. The 15 and their full names in order of their use are: GSA, General Services Administration; RFC, Reconstruction Finance Corporation; USBM, United States Bureau of Mines; DMEA, Defense Minerals Exploration Administration; ECA, Economic Cooperation Administration; DMPA, Defense Materials Procurement Agency; MSA, Mutual Security Agency; DMA, Defense Minerals Administration; DPA, Defense Production Authority; NPA, National Production Authority; SWPC, Smaller War Plants Corporation; SDPA, Small Defense Plant Administration; ODM, Office of Defense Mobilization; WPB, War Production Board; and NMAC, National Minerals Advisory Council.

• *Own Exploration Projects Dropped*

It appears that the USBM has practically abandoned its own exploration programs and is telling applicants to apply to DMEA for a matching-funds exploration loan instead. The bureau believes it would not be fair for one operator to get a free ride and another to pay part of the costs of exploration. All of which means that a number of properties of merit will go unexplored. Many are of the opinion that it should be possible for an applicant to borrow 100 percent of the money required for exploration and development of a worthy project, as was done so successfully during World War II through RFC loans.

• *Strategic Metals Division Finds New Home*

The strategic metals unit of ECA, which had been dangling between the agencies for some time awaiting a place to light, finally has been transferred formally to DMPA. Charles E. Stott will continue to direct it. Canadian activities, however, have been transferred to the domestic branch of DMPA which is directed by James Douglas. Under ECA, swallowed by MSA on December 30, 1951, the Strategic Metals Division was able to do a direct, simple and uncomplicated job that produced results. It will be interesting to note if the same snarls in procedure develop which have plagued DMA, DPA, and DMPA.

• *Pressure Applied At Wrong Place*

We often have commented, as has United States Senator James E. Murray of Montana, that the government is continually mining metal from the open market, a term for the squeeze which NPA allocation and restrictive orders put on the civilian economy. It does not imply that some squeeze should not be put on the civilian economy. Guns come before butter in a national emergency always. The thing that gripes people is the apparent lack of concern in the agencies which have the responsibility for getting out more primary metal. The more primary metals and minerals we mine now, the less "squeeze" it is necessary to apply. Recently DPA, the planning agency which to a great extent directs NPA and DMPA, is putting pressure on the Munitions Board to release more stock-pile materials instead of creating a liberal policy for domestic mining and directing DMPA and RFC to put forth every effort to expand present production and to start new mines.

• *A "Multi-Price" System May Follow*

It will be interesting to watch what the so-called Capehart amendment will do to the metal industry, following the ruling under GOR 21 that prices can be set from a base period through January 1 to June 24, 1950, as the highest price at which the commodity was sold in substantial quantities during this period. It is understood that some zinc is being offered in the domestic market for as high as 35 cents per pound. This will be a "multi-price" system.

• *Agency Will Set Price and Terms*

Howard I. Young, deputy administrator of DMPA, recently stated that every possible source of economically feasible manganese ore, both foreign and domestic, must be developed to its fullest extent. The need for manganese, as is true in the case of tungsten and the other strategic metals, is measured by the price and terms the government is willing to set. Therefore, the term "economically feasible" is purely a matter of agency determination.

• *DMPA Will Launch Mica Program*

The Defense Materials Procurement Agency seems to be catching the backwash of the pressure on NPA for greater quantities of strategic materials. Tom Lyon, director of DMPA's program-development division, has been meeting with its lead industry advisory committee to determine ways and means of increasing lead production here and abroad.

At the same time, Jess Larson, administrator of DMPA, has announced another one of those nebulous programs. This time it is for highgrade mica "under a price schedule designed to insure operators of a sustained opportunity to develop their mines, as well as to stimulate reopening additional sources of the critically needed mineral, where an outlet for production is assured."

It is to be prayerfully hoped that this program, which will also cover beryl, tantalite and columbite, fares better than the ill-fated manganese and tungsten programs. No details have been published by Larson, but he stated the "full details of the plan probably will be announced in the early part of 1952."

• *Chrome Output Is Negligible*

It is a sad commentary on the government's chrome program that the domestic production of chromite for the third quarter of 1951 totaled the startling figure of 637 short tons! Considering the enormous Montana reserves this is a pitiful record.

Of the total chromite coming into the United States during the same third quarter of 1951, Turkey supplied 29 percent, South Africa 24 percent, the Philippines 18 percent, Rhodesia 16 percent, Cuba 5 percent, New Caledonia 5 percent, and miscellaneous foreign sources the remaining 3 percent.

• *Authority Is Too Limited*

During the last war, the SWPC went into the mine-financing business, helping properties which could not get RFC loans. Now we have the SDPA, headed by Telford Taylor. This new set-up does not have nearly the authority delegated to SWPC and, furthermore, does not have independent loan funds. It is dependent upon certifying cases to the RFC, as is DMPA.

After seeing the President recently, Taylor announced that President Truman is "considerably concerned" about material shortages. That concern should be passed down to the right people in ODM and DPA, the agencies which make policy for DMPA. Something should be done, something can be done, but will anything worthwhile be done?

• *Over-Market Contracts Are Planned*

The announcement of the over-market contract plan for copper mines which are in distress, due to rising costs, shows a definite move forward on the part of DMPA toward a specific subsidy program. In effect, each contract is to be a special premium price plan for the particular mine as, according to the DMPA announcement of December 13, "Each individual case will be carefully analyzed and the over-ceiling price granted will be the amount considered necessary to maintain production."

Quota Committee analysts of the WPB during the last war performed precisely this function.

DMPA's plan is a far cry from the across-the-board premiums recommended by the NMAC and supported by certain government officials. The chief difference between it and the Murray-Baring incentive payment plan is that it would be a cumbersome device if applied to more than the dozen mines it is designed to help.

INTERNATIONAL PANORAMA

HONG KONG—The lead-silver mine of the Hong Kong Mines, Ltd. in the new territories of Hong Kong has resumed operation. The mine is under lease to Tonley and Company, Ltd., a Hong Kong firm.

YERINGTON—The Anaconda Copper Mining Company has awarded a contract for the erection of houses, power lines, water supply and sewage disposal at its new Yerington open pit copper mine at a cost of $2,500,000.

ELIZABETHVILLE—Production of copper by Union Miniere du Haut Katanga during 1951 was about 185,000 tons and was the largest output for one year in the company's history. Production of both zinc and cobalt was also increased.

BOGOTA, COLOMBIA—Las Payas Mining and Development Corporation, a subsidiary of the Callahan Zinc-Lead Company, is shipping high grade zinc ore from its Medina mine to the United States.

TORONTO—During 1951 Canada was the world's largest exporter of aluminum, asbestos, nickel, platinum group metals, and zinc. It ranked third in both copper and lead exports.

DETROIT—Iron ore shipments to the Ford Motor Company's River Rouge steel plant in 1951 totalled 1,589,317 gross tons. All delivered by Lake carriers.

PARIS—Aluminum production in France during 1951 was at an all time high—115,000 metric tons. Bauxite production increased to over 1,000,000 metric tons during the year.

PITTSBURGH—Aluminum output in the United States during 1951 increased 17 percent over 1950 production to 840,000 tons. Six new plants now being built will increase capacity to 1,500,000 tons per year in 1954.

BELGRADE, YUGOSLAVIA—Reports circulating here late in December indicate the possibility that the government may soon announce a revision of policy which will permit investment of private foreign capital for developing Yugoslav metal and mineral resources.

TEXAS CITY—Ore receipts at the RFC Longhorn tin smelter in 1951 were 71,596 tons of ore containing 33,942 tons of tin. The ore was mined in Bolivia, Indonesia, Thailand, Belgian Congo, Mexico, Alaska, and Portugal.

JOHANNESBURG—Exports of diamonds from the Union of South Africa and South West Africa during the first nine months of 1950 were 3,659,268 carats valued at £24,012,362.

BANGKOK—United Minerals Ltd. has signed a mining contract with the Consolidated Mining & Smelting Company of Canada Limited for lead-zinc production from its mine in northwest Thailand. Production and exploration will be supervised by Consolidated.

ESCANABA, MICHIGAN—The giant ore carrier, Wilfred Sykes, of the Inland Steel Company transported a record 828,000 gross tons of iron ore to Indiana Harbor during the 1951 Great Lakes shipping season.

SUDBURY—Nickel production in Canada, New Caledonia and the United States during 1951 was 295,000,000 pounds, a 10 percent increase over 1950 production.

WASHINGTON—During 1951 the Defense Production Administration authorized accelerated amortization certificates for 23,000,000 additional tons of steel capacity in the United States.

PITTSBURGH—The United States Steel Corporation broke all production records during 1951. Shipments of finished steel products were 24,250,000 net tons, an increase of 7.1 percent over 1950 shipments.

CARLSBAD—First shipments of potash have been made from the mine of the Duvall Sulphur & Potash Company. This makes the fourth potash mining company now shipping New Mexico potash.

NEW ORLEANS—Total United States production of sulphur in 1951 was 6,200,000 long tons. Gulf coast salt dome sulphur production was 5,325,000 long tons. 1951 exports were 1,300,000 long tons.

SAO PAULO, BRAZIL—Plans have been made for the construction of a steel plant adjacent to the Port of Santos. The cost of the plant will be equally divided between the State of Sao Paulo and private sources.

OTTAWA—Canadian production of zinc in 1951 reaches an all time high of 320,000 tons valued at $117,000,000.

TWO HARBORS, MINNESOTA—The last Lakes ore carriers of the 1951 Upper Lakes shipping season were loaded here on December 10th. The 260-day shipping season was 15 days longer than in 1950.

MONTREAL—Canadian industries have been allocated 86,250 tons of sulphur for the first quarter of 1952. The sulphur is imported from the United States.

DULUTH—Pittsburgh Steamship Company (United States Steel Corporation subsidiary) established a new record by transporting over 26,000,000 gross tons of iron ore from Upper Lake ports to Lower Lake steel plants in 1951. Sixty-one Lake carriers were used by the company.

WASHINGTON—Estimated defense needs for metals in the first quarter of 1952 are: carbon steel, 42.1 percent of the 19,385,000 tons estimated to be available; alloy steel, 52.7 percent of 1,600,000 tons; stainless steel, 58.9 percent of 140,000 tons; aluminum, 59.8 percent of 310,000 tons.

PHOENIX—The 1951 production of copper in Arizona was 421,000 tons—the greatest yearly output in history. Zinc and lead production was lower than in 1950, however.

Joint Operation Planned For Missouri Mine

Joint operation of the Quick Seven zinc-lead mines near Neck City, Missouri is planned by the American Zinc, Lead & Smelting Company and Brown & Root, Inc. of Houston, Texas. A contract with the United States government on the metal to be produced is said to have made the operation possible.

These properties have been controlled by Brown & Root for some time, but had not been in operation within recent years. Joint operation of the open-pit mine will necessitate construction of a 2,000-ton-per-day concentrator.

J. J. Inman, manager of the Tri-State district for American Zinc, will direct the new operation. The properties are expected to be in capacity production during the second quarter of this year.

Hong Kong Mine Leased to Chinese Firm

The property of Hong Kong Mines, Ltd. located in the new territories of Hong Kong, has been leased to Tonley and Company, Ltd., a Chinese mining firm of Hong Kong. A crew of 111 men is now working, and the force is expected to be increased to 300 as soon as equipment and good men are available.

Prior to the war, the mine operated steadily from 1937 until July 1940. During that time, 25,640 tons of concentrate were produced, containing 14,210 tons of lead and 522,100 ounces of silver. All surface installations, including a 225-ton-per-day flotation mill, were destroyed during World War II.

T. A. Martin is acting chairman of Hong Kong Mines in the absence of L. R. Nielson. George Scholey is managing director.

Old Tin Mines To Be Reopened in Tasmania

Renewed activity in the tin mining industry in Tasmania will result from the reopening of old mines in the Weldborough district, and proposed extensions to the Briseis mine owned by Briseis Tin, N.L. at Derby.

This mine was formerly the biggest alluvial tin producer in Australasia. The management hopes to increase production to 80 tons a year during the next twelve months. Although the lode is being worked for the third time, the operations are profitable because of the price for tin, which is now $1568 a ton.

It is planned to open up the whole of the old Briseis mine face, and production is then expected to reach 360 tons a year. This work is estimated to cost $224,000. The Bureau of Mineral Resources of the Ministry of National Development plans to make a geological survey of the Briseis mine district.

Teekay Mines, Inc., is shipping battery grade manganese oxides concentrated from ore produced at the Ladd mine, idle since World War I. Ore was first taken from this mine in 1867 by A. S. Ladd. Due to the prohibitive costs of shipping the ore around Cape Horn to England and the lack of domestic markets at the time, production soon ceased.

CALIFORNIA MANGANESE MINE

Teekay Mines, Inc., subsidiary of Taylor-Knapp of Philipsburg, Montana, is supplying battery grade oxides from one of the state's oldest mines.

Manganese is one of industry's critical necessities—a material for which no substitute is known in steel production and in the manufacture of dry batteries. Furthermore, during times of world-wide political unrest, continuous shipments are not guaranteed from the foreign sources of manganese upon which the United States depends for nearly 90 percent of its needs.

The situation is not of recent origin but has been recognized as crucial for many decades. Increasing the domestic reserves of manganese has been one of the most acute problems facing officials of both industry and government. Unhappily, the best efforts of those concerned have resulted in few new domestic producers. An important exception is the new plant seven miles south of Tracy, California, built to process oxide ore from the nearby Ladd mine by Teekay Mines, Inc., subsidiary of the Taylor-Knapp Company of Philipsburg, Montana.

LEFT: C. P. Knaebel is vice president and chief engineer of Teekay Mines, Inc., newly organized subsidiary of the Taylor-Knapp Company, long-time producer of battery grade manganese oxides at Philipsburg, Montana. CENTER: Jesse Wilson is the mill foreman at the Tracy, California, concentrator of Teekay Mines. RIGHT: Harold Kaiser, chemist and assayer, is properly proud of the modern laboratory at the Teekay mill where mine and mill samples are continually checked for production control.

19th Century Producer

The Ladd mine, on the P. J. Connelly ranch in southern San Joaquin county 13 miles southwest of Tracy, first produced manganese in 1867 when A. S. Ladd shipped ore around Cape Horn to England for use in the manufacture of chlorine. Though ore flow to England ceased in 1875 due to prohibitive shipping costs, the Ladd continued to produce ore for domestic battery manufacturers until 1900.

After the cessation of Ladd operations at the turn of the century, the mine was inactive until foreign shipments of ore were curtailed by World War I. After the armistice, mining ceased once more and no production is recorded for the property after 1919.

The Ladd mine is in rugged country ranging in altitude from 600 to 3,000 feet. Access is afforded by a gravel-surfaced road leading about 2 miles from the mine to a bituminous-surfaced county road that passes near the mill.

Taylor-Knapp Experiments

Recently Taylor-Knapp, long-time producer of battery-grade manganese, completed extensive tests that proved the Ladd ore would make battery-grade oxide with suitable beneficiation. The property was subsequently sub-leased from Mack C. Lake, who has the primary lease from P. J. Connelly, and a new subsidiary was formed—Teekay Mines, Inc. Under the direction of S. R. Knapp, president of Teekay Mines, A. V. Taylor, vice president and general manager; C. P. Knaebel, vice-president and chief engineer; James A. Briggs, business manager; and Jesse Wilson, mill foreman, a 100-ton mill was designed and erected.

Government Exploration

Detailed geologic investigation of the Ladd-Buckeye district, in which the Ladd mine is located, was carried on by the United States Geological Survey, beginning in 1940. During this period the United States Bureau of Mines also explored the area by opening adits, driving several crosscuts, sampling extensively and sinking 15 diamond drill holes—five at the Ladd mine. The findings of the two federal agencies were published by the California Division of Mines in Bulletin 125, *Manganese in California, 1943*, and Bulletin 152, *Goelogic Description of the Manganese Deposits of California, 1950*.

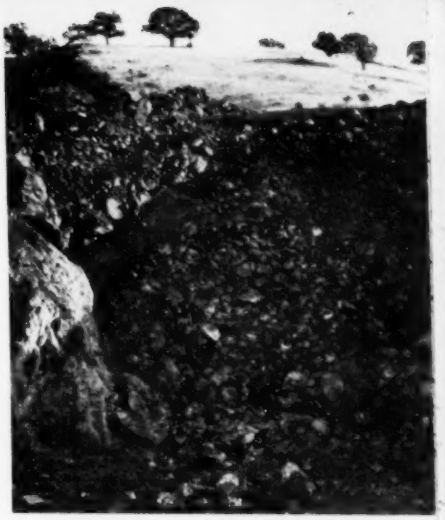
Franciscan Occurrence

The deposit is a hanging wall stockwork in the Franciscan group of Jurassic(?) age in a bed of massive white chert overlain by bedded red chert. The lower portions of the ore beds consist largely of rhodochrosite ($MnCO_3$). The ore grades upward into dense oxides and near the surface into soft, disseminated oxides of lower grade. It is thought from correlation with lesser manganiferous zones in the area that the origin of the Ladd deposits is sedimentary. It has been suggested that the deposits were laid down in a marine basin in the near absence of oxygen, forming rhodochrosite that graded on the periphery of the bed into disseminated bementite ($8\,MnO \cdot 5H_2O \cdot 7SiO_2$) or other hydrous manganese silicates.

After uplift, deformation, faulting, and erosion, the beds assumed their present attitude. The general strike is to the northwest with a steep dip to the west. Apparently the Ladd deposits form a part of either the northeast limb of a syncline or of overturned beds, since the general dip in the area is to the east. The Franciscan group terminates to the northwest against the Tesla fault which brings the formation in contact with the San Pablo (Miocene) formation.

Upon exposure, the rhodochrosite and bementite oxidized to a depth of over 300 feet and formed the massive and disseminated oxide zones that are being mined. The chert near the surface is silicified into a hard dense ore to a depth of 10 feet. Below this depth, the ore becomes soft and porous before grading downward into the dense oxide zone.

Evidence of hydrothermal alteration, subsequent to oxidation, exists in the form of (1) a network of small quartz and rhodochrosite stringers in the ore, (2) wall rock alteration, and (3) manganese staining along small wall rock fissures. Since the ore is confined to a single stratigraphic zone, there appears to have been little or no ore migration from hydrothermal action.



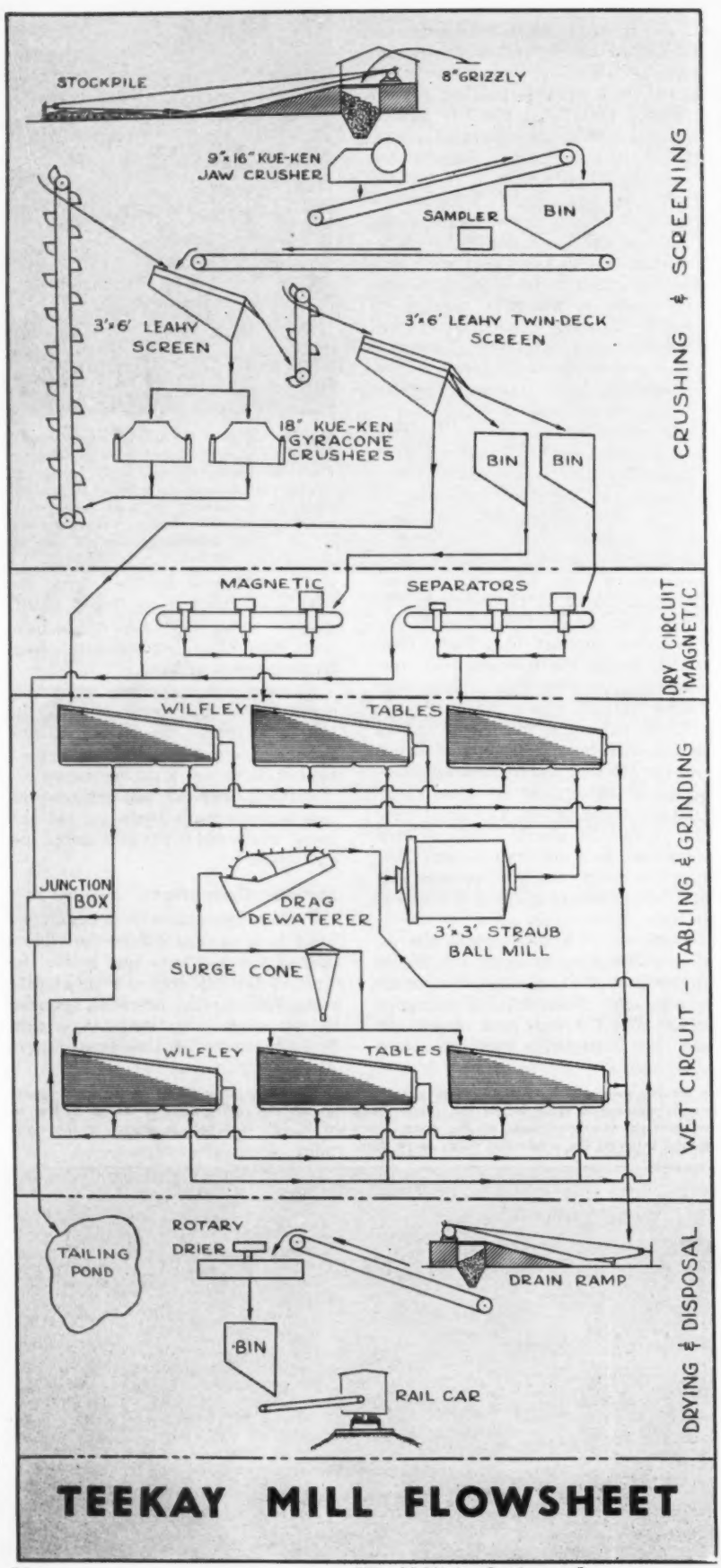
This 20-foot open cut is the producing bench at the Ladd mine, under lease to, and operated by Teekay Mines, Inc. The ore occurs as manganese oxide in a hard, white, fractured chert. Though it drills and breaks easily, its abrasive nature wears bits and mill machinery rapidly.

The original operations were concentrated in the lower part of the ore body where the carbonate and dense oxide ores yield above 40 percent manganese. With the exception of a small open cut, the early workings were entirely underground and many of the old drifts and stopes are still open.

Surface Operations

Present operations have been confined to a surface cut in the widest part of the ore body just below the crest of the hill that the shoot dissects. The ore that has been exposed on the surface by stripping a thin (4-foot) layer of low-grade chert

LEFT: Continuation of the Ladd vein is shown here looking southeast from the present working face. The open cut and adit in the upper center are part of the original workings. RIGHT: The company-maintained road in the left center leads through the rolling hills of Corral Hollow to a paved county road and thence to the new concentrator six miles northeast of the mine. Geologist W. W. Mahrholz is shown in the right foreground bringing the production maps up to date.



TEEKAY MILL FLOWSHEET

would indicate that at the present rate of mining the ore available from surface workings will be exhausted in two or three years. When this ore has been depleted, Teekay Mines will move operations to the old underground workings. The Bureau of Mines exploration indicated that the deposit contained 190,000 tons of oxide reserves averaging 20 percent manganese (about 28 percent manganese dioxide).

The cut that is now being mined measures 20 feet from toe to crest with a crest width of 35 feet. Ten-foot vertical holes are drilled on four-foot centers in a line five feet from the crest. The two-man mining crew uses Carset bits on five changes of ⅞-inch steel mounted in 55-pound Cleveland and Gardner-Denver sinkers. Bits are reconditioned by the miners in the mill shops.

Due to filled fractures in the indurated surface chert, the ore drills and breaks easily though its abrasive nature causes severe bit wear. Vugs are encountered at times that prevent powder loading to the full 10-foot depth. The holes are started and drilled to a depth of ten inches with a bit large enough to admit a 2-inch casing 16 inches long, preventing entrance of chert fragments from the raveling collar. The casing serves also as a plug and marker while other holes are being drilled.

The completed holes are loaded with 15 sticks of #6 Hercamite powder to within three feet of the collar and stemmed with drill cuttings. The blast has little backbreak and no toe holes are used. The loading shovel digs the lower ten feet of the face with little trouble since the ore at this depth is less indurated than that nearer the surface.

Periodic Mining

Though drilling and blasting are done by company men, loading and hauling are contracted to local construction companies. The broken ore is loaded into dump trucks by a ¾-yard Diesel shovel and hauled to a stockpile at the mill. Because mining can be carried on at a rate in excess of mill consumption, mining is not continuous. When the stockpile has ore sufficient for two or three months of mill operation, mining ceases until the stockpile reserves near depletion. Mining on a one-shift basis for 30 days produces the mill heads necessary for 90 days.

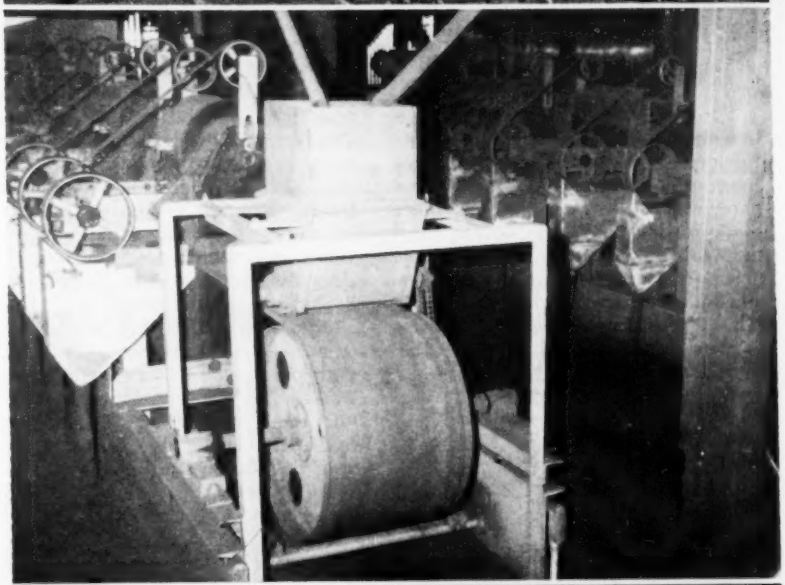
Water Dictates Millsite

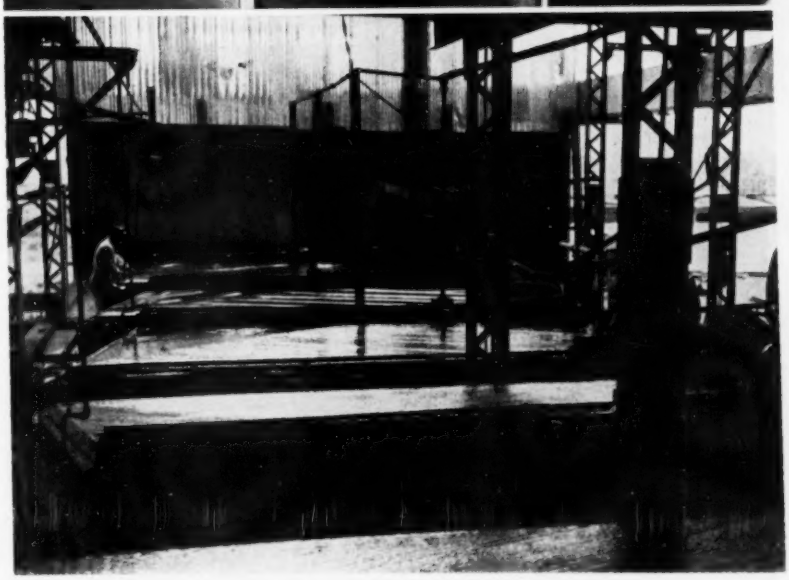
When no water could be found in the area near the mine, Teekay Mines chose a millside six miles from the mine at the mouth of Cor-

ral Hollow near a spur of the Western Pacific Railroad that once serviced numerous gravel pits no longer operating. The plant concentrates crude ore, ranging between 25 and 33 percent manganese dioxide, by dry magnetic separation and wet tabling to a battery-grade product that varies between 52 and 62 percent manganese dioxide, depending on the specifications of the various battery manufacturers that Teekay supplies. Fortunately, production was begun before the plant was completed, for the abrasiveness of the ore caused a change in the original design. The rolls that were to be used in conjunction with a Kue-Ken gyracone for fine grinding could not stand up under the constant abrasion and were replaced by a second cone crusher. Chief Engineer Knaebel says that he "thinks very highly of Kue-Ken equipment."

Crushing and Screening

Ore is taken from the stockpile by a three-drum Ingersoll-Rand elec-





TOP: The new manganese mill of Teekay Mines, Inc., near Tracy, California, is producing battery-grade concentrates. Full production of 90 tons per day was reached in January, 1952. CENTER: Primary concentration of the crushed and sized ore is a dry process involving these two banks of Wetherill-type magnetic separators. Each separator has three units of 30,000, 60,000, and 100,000 ampere turns. BOTTOM: The second section of the mill circuit uses a series of six large Wilfley tables for final concentration.

tric hoist and scraper slushing up a ramp at one end of the stockpile through an 8-inch grizzly to a 9- by 16-inch Kue-Ken jaw crusher. The crushed ore is transferred by an 18-inch belt conveyor to a 150-ton bin. As the ore leaves this bin it is automatically sampled before being conveyed by a second belt to a 3- by 6-foot Leahy screen that separates the ore stream into two fractions—minus 0.078-inch and oversize.

The oversize is fed by gravity to two 18-inch Kue-Ken gyracone crushers that operate in closed circuit with the Leahy screen by bucket elevator. The finer fraction is lifted to a 3- by 6-foot, twin deck Leahy screen by a second bucket elevator.

Dry Concentration

The twin deck screen separates the stream into three sizes—minus-0.078 and plus-0.053-inch, minus-0.053 and plus-0.021-inch, and minus-0.021-inch. The two coarsest fractions are fed by gravity to temporary-storage bins from which they flow to two banks of Wetherill-type magnetic separators, each with three units of 30,000, 60,000, and 100,000 ampere turns.

LEFT: U. F. Roscoe and Rupert Mock are using Carset bits on ⅞-inch steel in a 55-pound Cleveland sinker to drill 10-foot vertical holes spaced on 4-foot centers in a line 5 feet from the crest of the bench. Ore blasted from the 20-foot face is loaded on contract into trucks by a ¾-yard shovel. RIGHT: Concentrate is loaded by conveyor directly from the storage bins into rail cars on a spur of the Western Pacific Railroad.

Through the crushing, grinding, and magnetic sections of the circuit the ore remains dry with an optimum moisture content of one to five percent. No provision has been made to dry the ore but plans provide for the addition of a primary drier to process material from the stockpile during periods of high humidity if found necessary. Tarpaulins are now used to cover the open stockpile and prevent an increase in moisture content during rains.

Wet Concentration

The fine fraction of the screened ore bypasses magnetic concentration and is pulped and fed to a Wilfley concentrating table. The concentrates from the two banks of magnetic concentrators are also pulped and fed to two other tables in the wet circuit. Middling from these two tables passes through a drag dewaterer and is ground in a 3- by 3-foot Straub ball mill. Discharge from the ball mill is passed to a surge cone and then sent, along with the overflow from the drag dewaterer, to two more Wilfley tables for final concentration. Middling from these tables is returned to the drag dewaterer and ball mill.

Tailing from the dry circuit is belt-conveyed to a junction box where it is mixed with the wet tailing and sluiced to one of the old gravel pits near the mill. The proximity of numerous large abandoned pits makes tailing disposal simple.

The final concentrate from the wet circuit is slushed over a drain ramp into a small bin. From the bin it is fed to a rotary drier and then transferred by belt conveyor to storage bins beside the Western Pacific spur. A small, movable belt conveyor loads concentrate from the storage bins into boxcars that are shipped to the battery manufacturers supplied by Teekay. The first car of concentrate was shipped from the new plant on November 7, 1951.

LEFT: The loading chute above was used for bulldozer loading into trucks from the toe of the ore bench when the operation began. The crest of the bench can be seen above the timber bumper on the dozing level in the upper right. RIGHT: Tailing from the mill is washed through a sluice to abandoned gravel pits near the mill.

Progress of construction at the copper mill in July 1951. This picture was taken looking north and shows the new coarse crushing and screening plant. When the crusher plant addition is finished, lead-zinc ore and copper ore can be crushed simultaneously in separate units and delivered to the fine ore bins without intermixing.

MOUNT ISA CONDITIONS FLOTATION FEED WITH SO_2 TO IMPROVE PB-ZN-AG RECOVERY

Recent metallurgical improvements at the Mount Isa lead-zinc concentrator of the Mount Isa Mines, Ltd. at Mount Isa, Queensland, Australia, include the use of SO_2 gas for conditioning the flotation feed and the use of a lead middling regrind unit, comprising a Marcy ball mill and a duplex Dutch State Mines cyclone.

Following extensive testing and pilot plant operation the entire flotation feed was treated with SO_2 starting in 1949[1]. The middling regrind unit was subsequently added.

Concentration practice is based upon two factors:

1. Sacrifice of lead concentrate grade in order to achieve satisfactory recovery, because concentrates are smelted near the mine.
2. Sacrifice of zinc concentrate recovery in order to obtain a high grade, since zinc concentrate must be shipped long distances and sold on the world market.

Fine Intergrown Minerals

Orebodies at Mount Isa are partial replacements of sheared Pre-Cambrian shales on the southern limbs of south pitching folds in beds which dip steeply west. The most important orebody is the Black Star, which consists, as far as developed, of three main lodes, No. 1, No. 2 and No. 5, arranged en echelon, progressively deeper and farther to the south. . . . The minerals in the Black Star lode, especially the sphalerite, pyrite and galena, are very finely intergrown, and the ore requires extremely fine grinding for effective concentration, which is carried out entirely by flotation[2].

In recent months about 50,000 tons of lead-zinc ore assaying approximately 7.5 percent lead, 7.2 zinc, 0.1 percent copper, 11.0 percent iron, 14.0 percent sulphur and 5.5 ounces silver per ton has been milled. Mill capacity is larger than the tonnage treated and a new differential lead-zinc flotation plant is under construction as well as a new copper flotation plant and blister copper smelter. The copper ore will be mined from a separate and distinct lode discovered in 1941.

Increase in Percentage Recovery of Lead, Zinc and Silver at the Mount Isa Flotation Plant From 12 Months Ended June 30, 1948 to 12 Months Ended June 30, 1950

Period	*Lead Recovery*	*Zinc Recovery*	*Silver Recovery*
12 months ended June 30, 1948	73.2	47.6	69.7
12 months ended June 30, 1949[1]	79.1	49.7	76.4
June 1949	83.8	51.0	81.7
September 1949	84.4	53.9	81.4
12 months ended June 30, 1950	84.7	55.6	82.2

[1]Sulphur dioxide (SO_2) treatment was introduced and used during only part of this period.

Crushing

Mine ore, up to 12 by 12 inches in size, is hoisted through the Urquhart

The Urquhart shaft and crushing plant.

shaft in 10-ton skips and dumped into a 1,600 ton capacity ore bin. From the bin the ore is fed to either of two, 24 by 36 inch, Blake type jaw crushers set at four inches. Two 5½ foot Symons cone crushers are used to reduce the jaw crusher discharge to a maximum particle size of one-inch. The ore is then screened with the minus-¼-inch material going to 6,000 ton capacity fine-ore storage bins. Plus-¾-inch ore is reduced in a Symons shorthead crusher followed by screening with the minus-¼-inch ore going to storage. All ore, plus-¼-inch and minus-¾-inch, in size is rolled until it is minus-¼-inch in a set of 72 by 20 inch Traylor rolls.

Zinc concentrate filter plant (foreground) and power plant at far right. Part of the mine-city of Mount Isa shows in the background.

Grinding-Classifying

Coarse grinding is in three 8 by 5 foot and one 10 by 6 foot Hardinge ball mills in closed circuit with Dorr classifiers. Fine grinding is in three 8 by 5 foot ball mills operating in closed circuits with three bowl classifiers. The ball mills revolve at 22 rpm. with a 20 ton ball load. The overflow from the bowl classifiers, 80 to 90 percent minus-200-mesh and 65 percent minus-325-mesh, flows to a 100-foot diameter Dorr thickener.

Sulphur Dioxide Conditioning

Thickener underflow is pumped to the top of a 30-foot absorption tower down which it flows counter-current to ascending sulphur dioxide produced by burning elemental sulphur in a small furnace at the base of the tower. Both sulphur supply and air inlet are controlled so that the pH of the solution in the "acid conditioner" is 6.3.

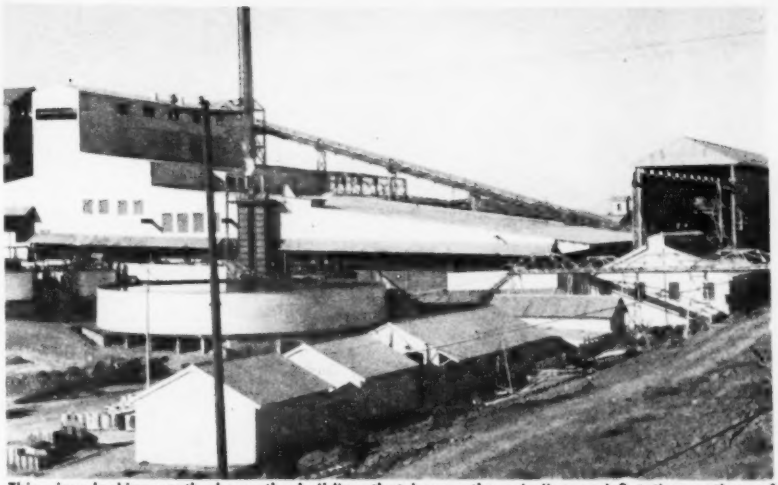
Following acid conditioning, the solution is adjusted to pH 7.4 by means of lime. The pH is controlled

by means of a recording pH meter. Originally, a glass electrode was used but, following erratic results, an antimony electrode was substituted and functions satisfactorily.

In passing to a surge tank, the pulp is conditioned with xanthate, potassium cyanide and zinc sulphate, cresylic acid and tar also being added as frothing agents.

Lead Flotation

The lead flotation section, all Fagregren machines, consists of four 12-cell 56-inch rougher cells, 12 56-inch cleaner cells and six 56-inch recleaner cells. The lead concentrate is pumped through a three-inch diameter pipe line to the smelter stock tanks. A typical analysis of the concentrate is 35.5 percent lead, 9.5 percent zinc and 24.5 ounces silver per ton.



This view looking south shows the building that houses the grinding and flotation sections of the mill circuit. The 100-foot Dorr thickener seen in the left center and the tower above it condition the ground ore with sulphur dioxide for subsequent flotation.

Zinc Flotation

Copper sulphate is added to the feed to the rougher section which comprises three 12-cell banks of Deco No. 24 Sub-A machines. Cleaning is done in a 12-cell bank of No. 24 Sub-A's. An additional bank of 12-cells has recently been installed in the zinc section.

Zinc concentrate, assaying approximately g1.0 percent zinc, 1.8 percent lead and 2.4 ounces silver per ton, is pumped through a 1,300-foot long three-inch diameter pipe line to the filtering and drying building. Shipping difficulties have forced stockpiling of much of the 4,000 ton per month output of zinc concentrate in recent months.

The final tailing averages about 1.3 percent lead, 2.2 percent zinc and 1.0 ounce silver per ton.

Increased Metal Recoveries

The accompanying table shows how effective the metallurgical changes have been in increasing lead, zinc and silver recovery at Mount Isa.

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[1] Sulphur dioxide conditioning has been applied with good effect at Lake George Mines, Captain's Flat, New South Wales, for six or seven years. At first, gas was produced by sulphuric acid acting upon a sulphite but a sulphur burner was subsequently employed. The ore is an intimate mixture of galena, sphalerite, chalcopyrite and pyrite grading into massive pyrite on the hanging wall. —Ed.

[2] From *Mineral Resources of Australia*. Summary Report No. 23. Lead. Bureau of Mineral Resources, Geology and Geophysics.

Flotation plant, Urquhart shaft headframe, lead smelter stacks, lead smelter and power plant buildings at Mount Isa Mines, Ltd. Part of the 1,000,000 tons of granulated lead blast furnace slag can be seen between the smelter stacks and the power house. This slag, assaying 14.0 percent zinc, may be treated at some future time in a zinc fuming plant.

The Nichols and Thompson diamond drill rig is shown working on hole no. 2 looking toward the rugged terrain of the upper Ima canyon. Note the steep slope on which the rig sits. The contract drilling was a part of a successful DMA-supported exploration program being completed by the Bradley Mining Co. to explore virgin areas in and near its Ima mine at Patterson, Idaho.

Alvin P. Nichols of the Nichols and Thompson Core Drilling Company, and Charles Hathhorn, manager of Bradley Mining Co.'s Ima properties, are examining the core recovered from the no. 2 diamond drill hole on the south side of Ima canyon.

TUNGSTEN FOUND ON DMA LOAN

The Bradley Mining Co. is completing DMA-approved exploration that has uncovered promising new veins at the Ima mine near Patterson, Idaho.

Mining World presents the following summary of recent exploration work at the Ima properties of the Bradley Mining Co. as one of the first of the DMA loans to domestic mine operators that has shown marked promise of increasing the known reserves of a critical defense metal—tungsten. The Bradley-DMA cooperation is the type of project that will give added impetus to government-aid mining programs. The present program, based on the sound theories of aid to the small-mine operator long advocated by many mining men, must be placed on firm footing by acquainting the public and Congress with its successes before the many constructive criticisms by the mining industry will be heeded (see "Capitol Concentrates" this issue). When only the failures and shortcomings of an aid project are emphasized, the entire program is in jeopardy of discontinuance.—Ed.

Of the exploration projects supported by the Defense Minerals Administration exploration loan program, one of the first to result in discoveries that promise to provide a substantial increase in known tungsten reserves in an active tungsten-mining district is being completed by the Bradley Mining Co. at its Ima properties in the Blue Wing district near Patterson, Idaho. (See *Mining World*, March, 1951, pp. 10-13.)

Rugged terrain

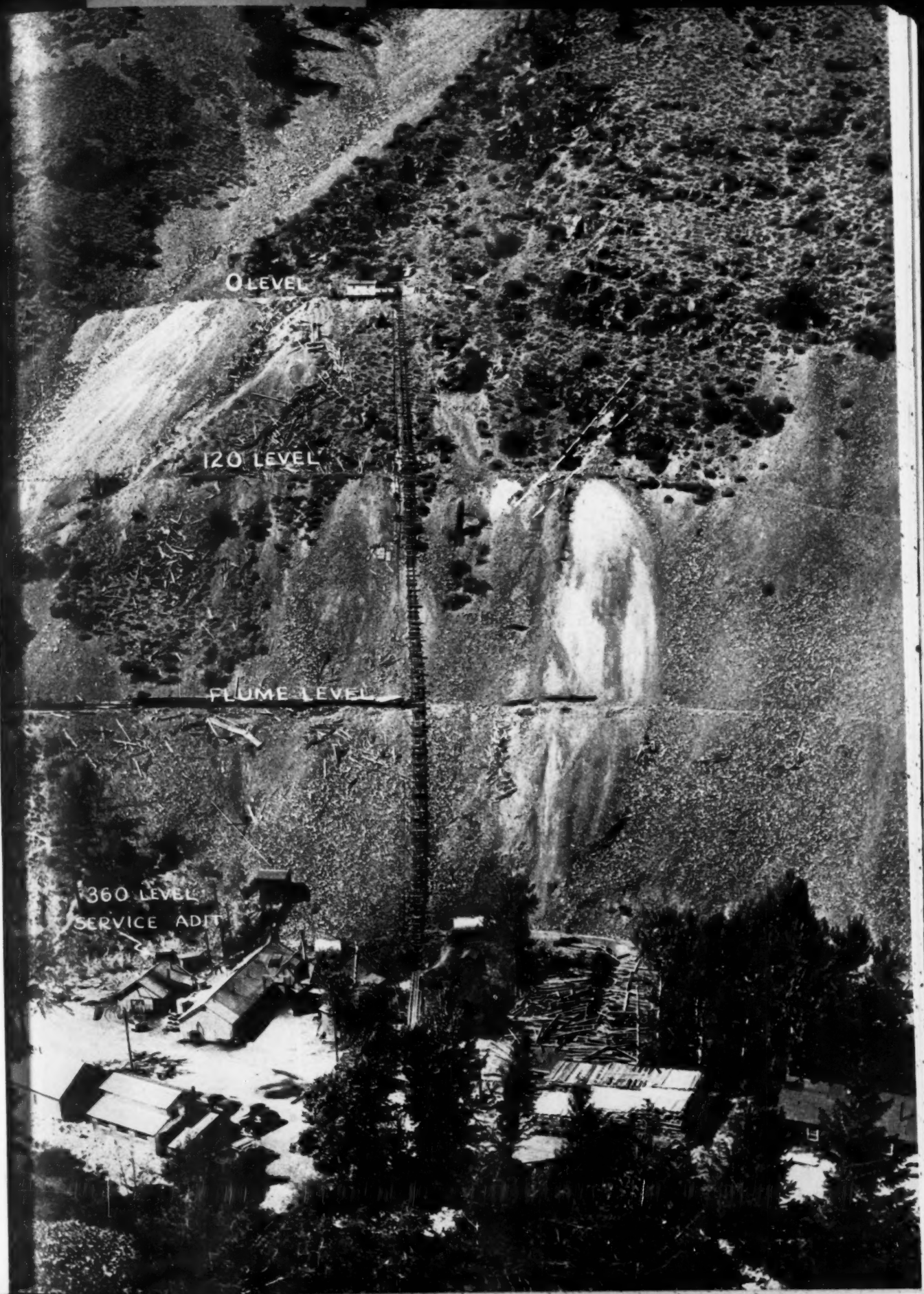
The Ima mine has been worked from eight levels—the A, O, 100, 120, 150, 200, 360 and 460—on the north slope of the rugged, mountainous Ima canyon about one mile upstream from the junction of Patterson creek and the Pahsimeroi valley, the site of the town of Patterson. The new Ima mill, completed in 1948, was built at the base of the canyon near the main haulage adit of the 360 level of the mine and ships three products concentrated from the Ima ore—hubnerite, scheelite, and silver-bearing base metal sulfides.

Mineralization long known

Mineralization in the Blue Wing district was known as long ago as 1881, though development of the tungsten ores did not begin until 1911. In 1917 development ceased and the area remained inactive until the favorable economic atmosphere of the late twenties caused renewed interest in the deposits during 1927 and 1929 period.

By 1934 development was resumed and in 1945 the Bradley Mining Co. of San Francisco negotiated purchase contracts for the properties

The upper level shown here leads from the adit on the zero level of the Ima mine. Proceeding down the steep north slope of the Ima canyon one sees the 120 level, the old flume level, and the service adit of the 360 level. At the adit to the right of the timber-hoist track on the 120 level, is a surface expression of a part of the main Ima vein system. A recent diamond drilling program, financed in part through a DMA loan, located what is regarded as the continuation of this structure south of Patterson creek. Previous attempts to locate this projection were unsuccessful due to the heavy covering talus on the south slope of the canyon. A second phase of the successful exploration, crosscutting from the 360 level of the mine, penetrated a high-grade, tungsten-bearing vein in a virgin area of the lower workings. The buildings on the canyon floor house the shops, framing mill, and timber yard. Timber is hoisted to the zero level by the steeply inclined track near the center of the picture.


O LEVEL
120 LEVEL
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360 LEVEL
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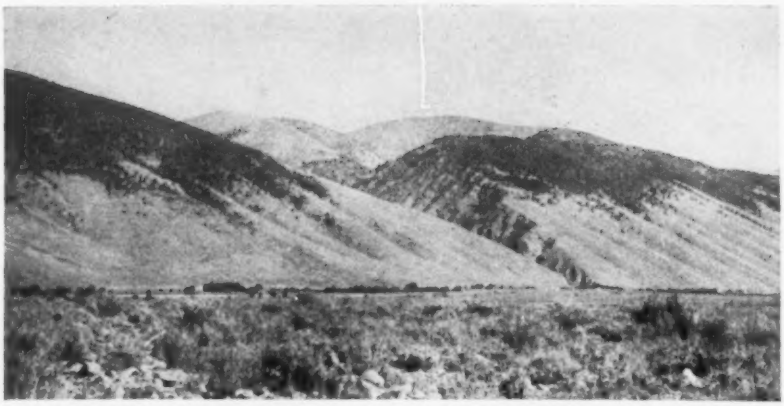


The mouth of the rugged Ima canyon, in which the Ima mine and mill are located, is shown here looking from the Pahsimeroi valley. The town of Patterson, where the company employees live, lies at the junction of the canyon and the main valley. The mountain front cut by the canyon is an excellent example of the gravity fault escarpments in the Basin Range.

held by the Ima Mines Corporation and the Tungsten Mining Corporation. During the seven years since Bradley began operations in the Blue Wing district, the Ima mine has assumed an important role in national tungsten production.

The Blue Wing District consists largely of Belt series quartzites intruded by pre-mineral chonolithic quartz monzonite plutons. Over seven separate fault systems along which movement occurred before, during, and after mineralization have been identified in the area. The mineralization followed fault fissures that were themselves previously and subsequently faulted, resulting in remarkably complex vein systems that cut across the quartzite-quartz monzonite contact with no apparent change in character. Due to the complex faulting, the economic character of the mineralization may vary in successive segments of the faulted veins. Thus, even though the location of the continuation of a tungsten-bearing vein can be predicted, there is no certainty that the continuation is similarly mineralized, with the result that exploration of each segment of the faulted vein becomes necessary.

Two distinct zones in Ima mine

One of the most important features in the Ima mine is a series of low-angle thrust faults that is responsible for many of the problems that make geologic interpretations difficult. One of these thrusts, known as the 9C fault, separates the area into two entirely unlike zones.

The pattern of the vein systems change completely as the 9C fault is passed and no correlation can be made between the vein systems that are found above the fault and those that occur below the fault. In places the 9C fault itself has been mineralized and one large section was profitably mined from the 200 level up to the 150. The levels above the fault had been worked farther northward than had the 360 level, which lies entirely below the fault.

Since nothing of the nature of the northern section of the mine below the fault could be inferred from the known areas above the fault, an exploratory drift on the 360 would be necessary to determine the existence and extent of the mineralization of this virgin area.

Veins cut by Ima canyon

A second important area for exploration lay south of the canyon. Patterson creek had obviously cut the main Ima vein system in forming Ima canyon. Though mineralization was known south of the canyon and had been explored by two adits, one driven by the U. S. Bureau of Mines, no orebodies were found. Furthermore, these adits had not been driven in the area of the projected continuation of the Ima vein system.

The projection of the general strike of the main vein system on the north side of the canyon intersected the extremely steep south slope in an area that was so heavily covered by a mantle of talus that examination of the surface by inspection or trenching was next to impossible.

Two-phase exploration

To test these two virgin areas for commercial mineralization, a subsurface exploration program was formulated consisting of two parts;

LEFT: Jim Justice tends the Christensen model JS diamond drill at hole no. 2 while his brother Leonard takes a welcome libation from the water bag. CENTER: Nichols and Thompson Core Drilling Company of Boise, Idaho, completed their surface drilling contract at the Ima properties with this Christensen rig, here operated by Leonard Justice. RIGHT: The site of the completed diamond drill hole no. 1 on the south side of Ima canyon west of drill hole no 2.

The Ima mill produces hubnerite, scheelite, and silver-bearing sulfide concentrates from the ores of the nearby mine. The mill is on the floor of Ima canyon about one mile from the junction of Patterson creek and the Pahsimeroi valley.

(1) 2,000 feet of drifting and crosscutting on the 360 level of the Ima mine to explore the area to the northward under the 9C thrust fault, and (2) 1,200 feet of diamond drilling from the surface to locate and test the continuation of the main Ima vein system south of the canyon and 500 feet of drifting and crosscutting to explore the mineralized areas found by drilling.

After examination of the property, the program with an estimated cost of $72,750 was approved by the Defense Minerals Administration for an exploration loan and work began in July, 1951.

Veins found south of canyon

The project is being supervised by Charles Hathhorn, manager of the Ima mine. Underground work is done by Ima miners and the surface drilling was contracted to the Nichols and Thompson Core Drilling Company, Inc., of Boise, Idaho. The diamond drilling was completed in October and the three 400-foot holes encountered two tungsten-bearing veins which unquestionably represent the continuation of the Ima vein system on the south side of Ima canyon.

Since the veins were somewhat east of the expected location, the DMA contract was amended to $92,250 to increase the drifting and crosscutting on the south side of the valley from 500 to 1,000 feet. This work will be carried out from the old U. S. Bureau of Mines adit because of the difficulty of spiling through the heavy talus nearer the veins.

New high-grade vein on 360

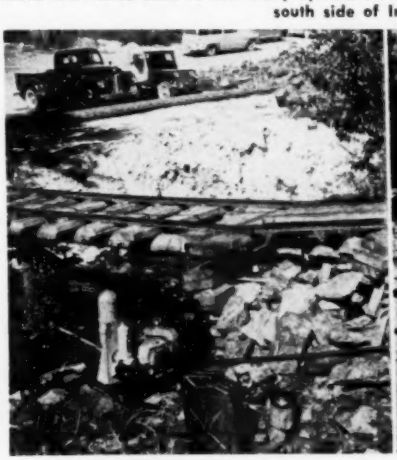
The drifting and crosscutting north of the canyon, also begun in July, will soon be completed; about 900 feet of work remain. The project is being carried out with days-pay miners working round in and round out on a two-shift basis.

The crosscut was driven through the granitic intrusion and is once again in quartzite. Shortly before Christmas and after 890 feet of crosscutting, an 8-foot, high-grade, tungsten-bearing vein was penetrated, proving commercial ore exists in the previously unknown area northward below the thrust fault. Though ore has been found, further development will be necessary to determine the structural patterns in the newly opened ground.

The increased drifting on the south side of the canyon will be started when the crews have finished the program on the 360 level of the Ima and the necessary preparatory work in the old U. S. Bureau of Mines adit has been completed.

To Consulting Geologist Doctor Carlton D. Hulin belongs the bulk of the credit for the formulation of the successful exploration program at the Ima mine. The confusingly complex vein and fault systems of the Blue Wing district had seemingly precluded solution until he correlated detailed investigations into a clearly drawn picture of the Ima structural patterns.

LEFT: The mighty midget in the center foreground is the Bean Royal 10 pump that delivered water from Patterson creek to the drill rig through a 1-inch pipe against a vertical lift of 175 feet. According to Alvin P. Nichols, it supplied more than enough water to the rig despite its small size (note the standard five-gallon jerrican in the foreground). The track above and behind the pump carried supplies and materials to the drilling level on which the three holes were collared. RIGHT: This logged and boxed AX core was taken from the second of three diamond drill holes sunk to find the projected continuation of the main Ima vein system on the south side of Ima Canyon.



REPORT FROM MEXICO

The First Mexican National Congress Of Mineral Resources Was Host To Miners And Geologists From All The Americas

In commemoration of the First Inter-American Congress of Mineral Resources the Mexican National Mint struck 2,500 special silver pieces. The obverse side of the coin is pictured here.

The third Congress of the Pan American Institute of Mining Engineering and Geology (IPIMIGEO) was officially opened in Mexico City by Miguel Aleman, President of the Republic of Mexico. As part of the first Mexican National Congress of Mineral Resources organized by the Mexican National Institute for the Investigation of Mineral Resources (INIRM), the Society of Economic Geologists, the Geologic Society of America, and the Mexican Section of the AIME held simultaneous meetings.

In view of the many organizations taking part in the Congress, and the importance of the mining industry in Mexico, it was not surprising to find official delegates in attendance from Bolivia, Brazil, Canada, Chile, Cuba, Ecuador, Guatemala, Mexico, Nicaragua, Peru, the United States, and Uruguay. With attendance well over 2,500, the congress was probably the largest 1951 mining meeting in the Americas.

Inter-American Cooperation

In opening the Congress, Antonio Martinez Baez, Mexican Secretary of National Economy, pointed out the solidarity of the Americas when he said, "at times such as the present, when the world is faced with serious disturbances, the fact is that mineral elements constitute a valuable factor in the defense of free nations."

Charles Will Wright, consulting engineer of Washington, D. C., and vice chairman of the United States Section of the Pan American Institute, outlined necessary steps to increase base metal production as follows:

"The Inter-American defense program contemplates increased base metal production within the Americas. This can only be accomplished by the establishment of a more favorable atmosphere within the Americas toward private enterprise by changes in exchange controls, taxes, tariffs, labor regulations, and greater protection for the mine investor. Not until there is a united effort among the American Republics, and in particular the United States, to carry out such changes will the necessary developments of the potential base metal deposits be carried out."

Spanish and English Sessions

Eight simultaneous technical sessions were held during the first two days of the congress with English and Spanish as the official languages. Speakers from Alaska to Chile discussed all phases of geology, mining, and metallurgy from dredging of frozen gold-bearing gravels to the studies of antimony occurrences.

Metallurgical Methods

The series of papers presented at the ore dressing and metallurgical sessions of the Congress was one of the outstanding events of the Congress. H. W. Hitzrot of the Dorr Company prepared a very complete paper for the purpose of aiding a plant operator in the selection of the best type of classification unit for the job to be done. A description of nine types of classifiers was given, and the limitations of mechanical-hydraulic classifiers and centrifugal classifiers were outlined. Limitations depend on the specific gravity of the material and the amount of hydraulic water used.

Bunting S. Crocker, mill superintendent, Lake Shore Mines, Kirkland Lake, Ontario, outlined the development of the use of screened ore for fine grinding at Lake Shore. A saving of $96,400, at January 1951 steel price, has been effected by pebble grinding the 1,000 tons per day of hard silicious gold ore to 90 percent minus-325-mesh. The grinding plant is more flexible than when it used steel balls because it is faster to change the size of grinding media. Lake Shore testing has determined that grinding mill capacity and power varies with the mill diameter raised to the 2.6th power so there is no advantage in using large diameter mills. Several smaller mills can be

Part of the crowd at the opening session. Many prominent mining men from the United States including J. B. Haffner, John F. Myers, Paul B. Jessup, Jay Carpenter, and J. P. Smith were at the session.

used to give greater flexibility and this flexibility without loss in efficiency is an important item in reducing costs.

"Lead-Copper Separation Processes at the Fresnillo Corporation" was the title of a paper which was heard with great interest by one of the largest crowds at any of the technical sessions. It was presented by C. J. Veale, Fresnillo's mill superintendent. He reported that the system in use since 1947 necessitated treating the bulk lead-copper concentrate with sulphurous acid to a pH of 3.5; then neutralizing the pulp to a pH of 6.5 with hydrated lime before refloating with starch solution for a galena depressant.

An outstanding feature of the sulphurous acid system is the improvement in the grade of copper concentrate over that obtained by the sodium dichromate process formerly used. From a lead-copper concentrate assaying 41.9 percent lead and 4.49 percent copper, a lead concentrate with 1.38 percent copper and a copper concentrate with 2.8 percent lead are produced.

Jumbo Drilling in Shrink Stopes

One of the outstanding papers at the congress, "Application of Jumbo Mountings to Drilling in Stopes In Medium Width Veins," was given by Vincente Cisneros, Jr., general superintendent of the Esmerelda mine of Minas De Iguala, S. A., a subsidiary of the Eagle-Picher Mining and Smelting Company.

Several drilling methods were tested at the mine in order to accomplish the following: 1) keep the drills in the stopes drilling as much of the shift as possible; 2) maintain a high drilling speed; 3) find a fast drilling, but cheap bit; 4) place as great a burden as possible on the holes; and 5) keep no broken ore reserve underground.

Various patterns and lengths of holes were tried, as well as several types of drill mountings. Testing is continuing but all drilling is now from a jumbo mounted on a rubber-tired, three-wheeled, M-W-6 Joy wagon drill. Each jumbo carries two machines equipped with LW-10A chain feed sashes 14 feet long which permit the use of 10-foot steel changes. The jumbo is advanced and a section drilled out from one end of the wide (13-foot) stope to the other. The number of longitudinal passes depends on the width of stope. By this method the tons of ore broken per man shift have been raised to 24.6 and the tons per foot of hole to 0.93.

Other mining papers included a description of "Primary Blasting Practices at Chuquicamata" by Glenn S. Wyman, assistant mine superintendent, Chile Exploration Company and "Water Problems of Leon and Congreso Mines of San Pedro Corralitos" by Luis Villasenor S.

Field Trips

Following the technical sessions, several days were devoted to field trips for the delegates. One of the most popular trips was to Taxco, Guerrero, where the mines are regarded by many writers as the earliest in North America. It is probable that silver was mined here before the Spanish conquest of Mexico that began in 1519. During the last 15 years, the district has become an important lead-zinc-silver producer and the American Smelting and Refining Company is now the most important company in the district. ASARCO was host to the delegates at a reception in the Hotel de la Borda and conducted a guided tour of its El Fraile differential flotation lead-zinc mill.

Other trips were made to the mines and mill of the Real del Monte y Pachuca Company at Pachuca, Hidalgo, and to the mine of the Cooperative Santa Fe de Guanajuato, at Guanajuato, Guanajuato.

Each registrant at the Congress received one of the special silver coins. Each coin is slightly larger than a United States silver dollar. The reverse of the coin is shown here.

LEFT: L. H. Lange of the Galigher Company, Salt Lake City, Utah, talks on "Agitair" flotation. CENTER: Officials of the Colorado Fuel and Iron Corporation are pictured at one of the technical sessions. FRONT ROW, left to right, are J. N. Counter, Denver, Colorado; Charles E. Gleson, Denver, Colorado; and T. Carlos Leon, Jr., Mexico, D. F. BACK ROW, left to right, are L. B. Morgan, New York, New York; Paul V. Svendsen, Pueblo, Colorado; and David L. Lee, Oakland, California. RIGHT: Sr. Ing. Manuel Villafana, Comesion de Fomento Minero, Mexico, D. F., outlines gold and silver recovery from ore at El Oro, Mexico.

ENGLISH DRAGLINE STRIPS 100-FEET OF OVERBURDEN AT CORBY IRON MINE

The 260-foot-long boom towers over the dragline at the Priors Hall open pit iron ore mine near Corby, Northamptonshire, England.

Details and welding of the tubular boom are clearly shown in this photograph taken 100 feet above the ground. Note the streamlined, air-conditioned operators cab.

One of the largest walking draglines in the world is now in operation at the Priors Hall open pit iron ore mine of Stewarts & Lloyds, Limited, near Corby, Northamptonshire, England. This huge dragline has a 260-foot-long boom and can lift a 52-ton load to a height of 120 feet above the base of the machine. The complete unit weighs 1,600 tons and swings a 20-cubic-yard-capacity bucket through a digging-elevating-swinging-dumping-return cycle in less than one minute's time.

It is designed to uncover 400,000 tons of iron ore per year from the gently dipping seven-foot-thick ore body.

Tubular Section Boom

The most unusual part of the machine is the 126.5-ton boom made entirely of steel tubes from 1¼ to 16 inches in dameter. In 1947, when the designing of the boom was first started the longest tubular boom was 30 feet. By 1948 a 113-foot-long boom of tubular construction was in use. The main compression and tension members were designed as twin tubes separated by welded tubular sections. Two main compression members extend from the heel pieces to the head end of the boom, and the main tension member from the head to the apex, where it divides into four tubular structures reinforced by lattice work from the apex to the heel pieces. The main compression members taper from 16 inches in diameter, under the apex, to 10 inches at the head end, and 15 inches at the heel. The main tension members taper from 15 inches at the apex to 5½ inches at the head end.

The twin tube construction was also used in building the "A" frame, the front and back legs of which are built into the main structure. The "A" frame forms an anchorage for the suspension member which holds the boom in the air.

The boom is made of steel tubes, plates, and forgings which have a high tensile strength and were suitable for electric welding with a minimum of pre- and post-heating. Because of the large size of the boom, it was necessary to do much welding in the open as the boom was assembled in the pit.

Special Steel For Boom

A special steel was developed for constructing the boom. It is a high tensile strength, fine-grained, chromium-molybdenum steel. A fine-grained steel was necessary for successful welding under the fabricating conditions and a McQuaid-Ehn grain size of six or finer was maintained throughout.

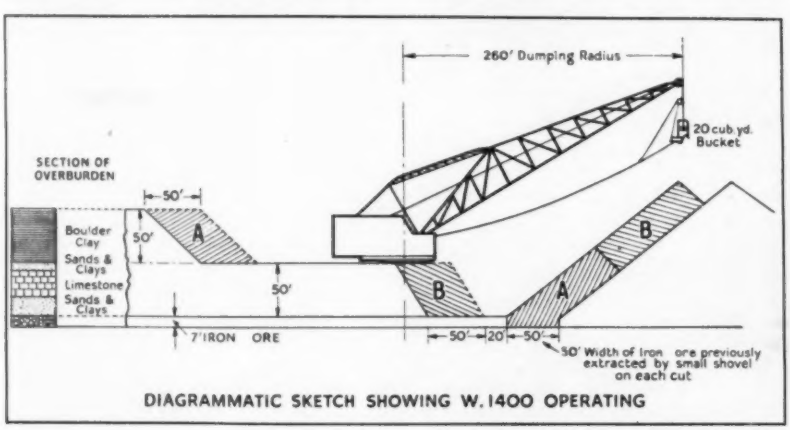
When the boom was completed, it was necessary to know accurately how much it weighed. It was considered that the total weight of the components and the estimated design weight would not be accurate enough so a number of Statimeters were used to weigh it. They are small hydraulic jack-like instruments with built-in pressure gauges. The actual weight was 94 tons which was within ½ ton of the designed weight. After the catwalk, lights, and suspension members were added the total weight reached 126½ tons.

The Stripping Cycle

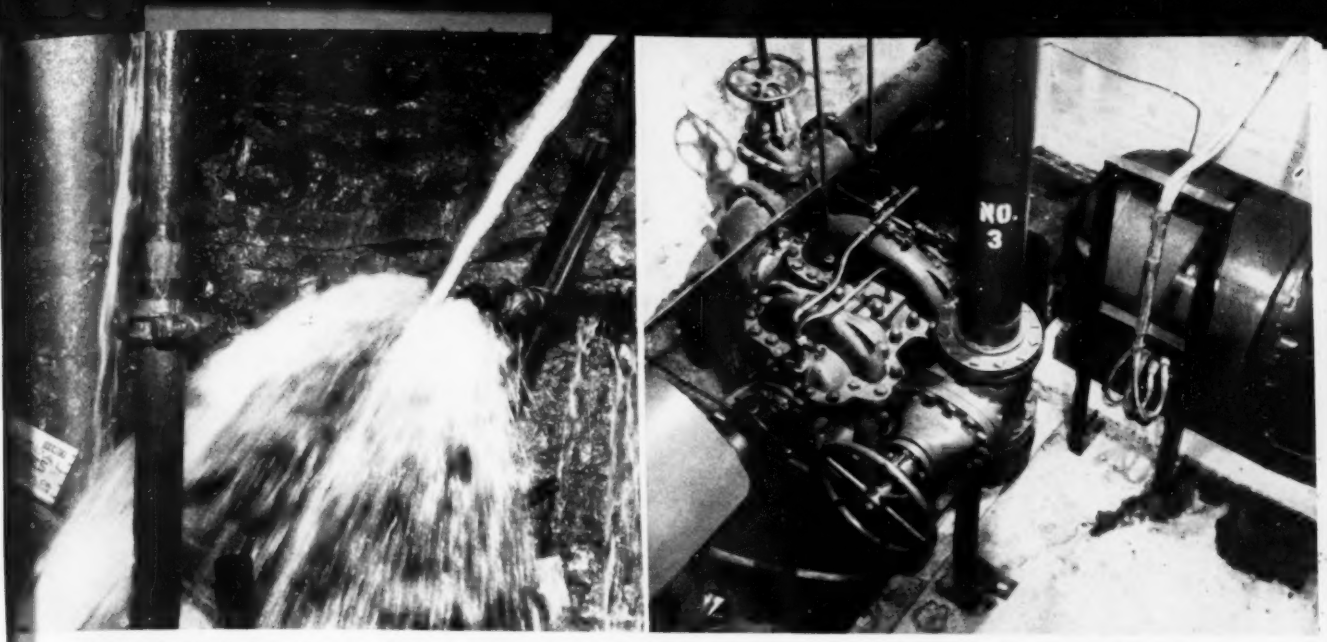
The W 1400 is used for stripping to a depth of 100 feet. Two 50-foot cuts are necessary to accomplish this. The dragline operates on a middle bench (see diagram) and digs the upper 50 feet of boulder-clay, and sand and clay above the base of the dragline. This cut is taken farthest from the pit with the dragline digging to its side. After making a side cast, up to 120°, the overburden is dropped into the bottom of the cut adjacent to the unmined ore. The lower 50 feet of overburden is dug in the second lift with the dragline digging below its base and elevating the spoil, during the 90° sidecast, to the top of the pile built up from the first cut.

Construction Details

The clearance radius of the cab is 68.5 feet and the width is 49.0 feet. The two walking shoes are, each, 48 by 9.5 feet. All electric motors are 225 hp. d.c. with four motor units driving the hoist, the drag, and the walking and rotation respectively.



DIAGRAMMATIC SKETCH SHOWING W. 1400 OPERATING



LEFT: Water flowing from diamond drill drainage holes on the 2,700-foot level. Valves regulate the inflow of water, most of which comes from the holes which have penetrated ore where the fractured quartz gangue affords channel ways for the largest part of water found in the mine. RIGHT: The No. 3 pump, intake line to the left, and vertical discharge column in the center.

CHIEF CONSOLIDATED'S NEW PUMPING PLANT WILL MAKE MINING POSSIBLE BELOW THE 2,500 LEVEL

The Chief Consolidated Mining Company has completed installation of a new pumping plant at its lead-zinc-silver mines in the Tintic district of Utah. The new pumping plant has a capacity of 8,400 gpm. and will permit the development and subsequent mining of 10,000 tons per month of ore from horizons below the mine's 2,600-foot level.

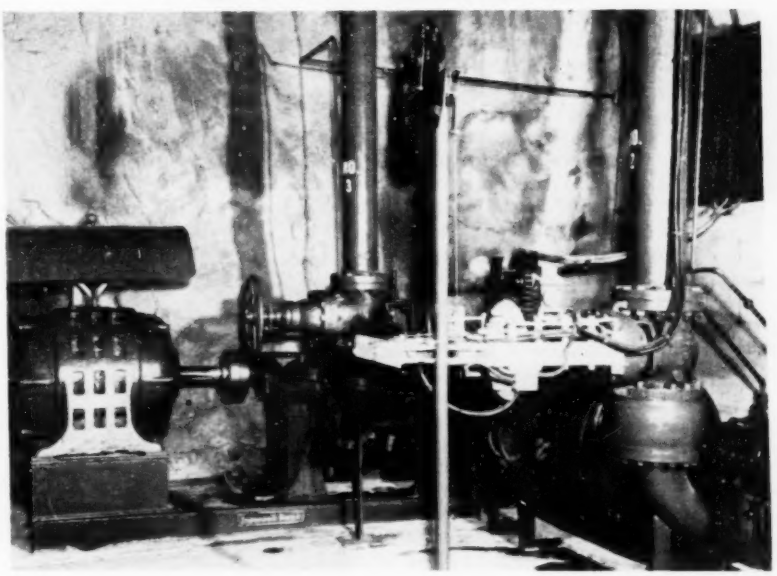
The new plant has been placed in operation on the 2,300-foot level adjacent to the old plant, which is still in operation and has a capacity of 6,000 gpm.

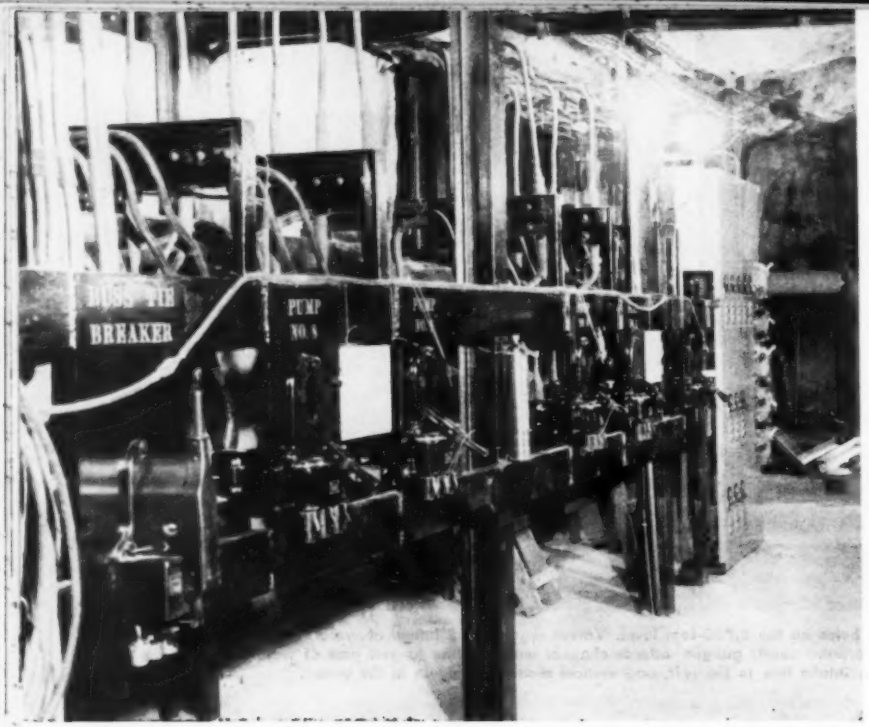
Porphyry Dike Dams Water

Water problems in the mine, situated in the bottom of a large syncline composed of limestone beds, are complicated by an east-west striking porphyry dike which acts as an underground dam.

Diamond drilling has indicated ore north of this dike, but attempts to penetrate the dike for mining operations below the 2,500-foot level have resulted in water inflows too great for the old pumping plant to handle. The dike has been penetrated on the 2,700-foot level, and an underground drilling station cut north of the dike from which a series of diamond drill holes drain the water. Most of the water is usually found in the ore bodies as the fracturing in the quartz gangue affords channel ways. Controlled drainage of the area above the 2,700-foot level through the diamond drill holes will permit mining both north and south of the dike. Mining is planned down to the 3,100-foot level.

The Nos. 2 and 3 pumps in the new pump station on the 2,700-foot level of the Chief Consolidated Mining Company's lead-zinc-silver mine at Eureka, Utah. Note the automatic, electrically controlled valve on the discharge column of the No. 2 pump. It operates from a float in the sump, opening and closing the valve as the water level in the sump rises and falls. The dial shows the number of turns the valve is open.





The new switch room is 12 feet higher than the pump room. Power is brought from the surface at 3,000 kva and 5,000 volts. In the switching station, power is transformed down to 2,400 volts by six Auto transformers which are Askarel-filled to make them fireproof.

Water to Ore: 156 to 1

Completion of the new plant has already permitted increased drainage and 7,000 gpm. are now being pumped. Engineers of the company anticipate possible inflows up to 10,000 gpm. as exploration drifts and diamond drilling are extended.

The company is now mining about 8,000 tons of ore per month and is pumping about 156 tons of water to each ton of ore. Pumping costs run between $12,000 and $15,000 per month.

The New Pumping Plant

Deep-well, submersible-type pumps are used to pump the water from the 2,700-foot level into the sump on the 2,300-foot level. In the new station, the pumps are placed outside of the sump and are separated from it by a concrete wall; the intake lines extend through the wall to provide a positive head to the three horizontal pumps. Pump Nos. 1 and 2 are each driven by a 600-hp. electric motor at 3,500 rpm. They are single-stage, Byron Jackson pumps and each will pump 4,000 gpm. at the existing 530-foot dynamic head. No. 3 pump is a two-stage, Ingersoll-Rand, driven by a 250-hp. motor and has a capacity of about 1,400 gpm. at the same head. Each of the larger pumps is fitted with an automatic electrically controlled valve designed by Alton Baker, chief electrician. The valves are controlled by a float in the sump which opens and closes the size of the discharge as the water in the sump rises and falls. No. 3 pump has a manually operated discharge valve.

Power Feed Cables

Increased power requirements for the pumping plant necessitated installation of a completely new 3,000-kva. electrical system.

Power at 5,000 volts is brought from the surface to the 2,300-foot level through the No. 2, concrete-lined, shaft by two 2/0 USKORON cables made up of six individu strands which were woven togeth by a copper wire after installatio The transformer room is 12 fe above the pumps; current is tran formed to 2,400 volts by six Aut transformers which are Askare filled to make them fireproof.

Water to Underground Cave

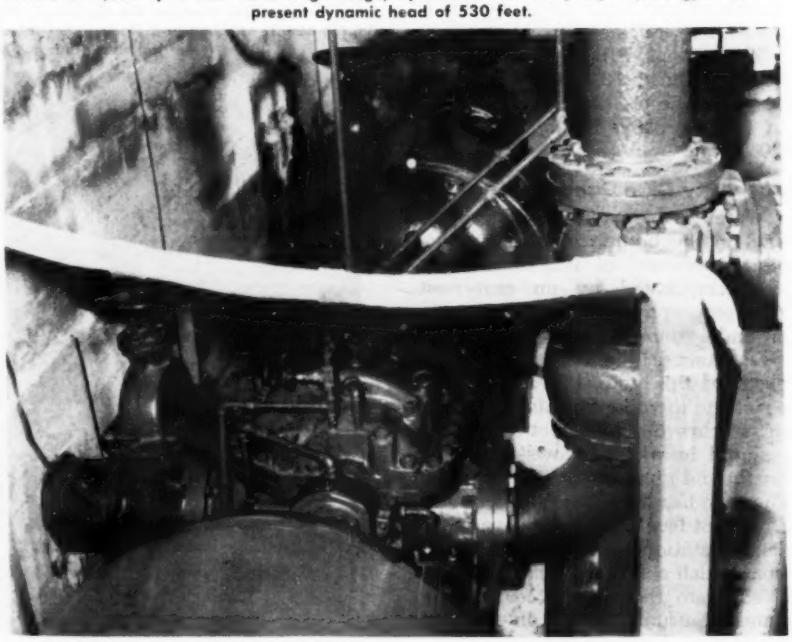
A new 18-inch discharge colum was installed in various existin raises and drifts to the bulkhead o the 1,800-foot level where water i discharged into a large undergroun cave about ¾ of a mile from th main workings of the mine. There is no recirculation of water once i is discharged into the cave.

Increased Exploration Planned

With the completion of the new pumping plant, sinking of the 18-41 interior shaft from the 2,700- to the 3,100-foot level has been started. A total of 5,000 feet of drifting, cross cutting, and raising will be done between these levels after the shaft has been completed. The new pumping plant and the exploration work are being done under the terms of a contract with DMA involving expenditures of $463,420 with the cost of the project borne equally by the company and DMA.

The photographs and data used in this article were supplied through the cooperation of Cecil Fitch, Jr., vice president and general manager, Chief Consolidated Mining Company, Eureka, Utah.

Nos. 1 and 2 pumps in the new station. Water-intake lines, shown at the left, lead to a positive head sump behind the concrete wall. These pumps are driven by 600-hp. electric motors at 3,500 rpm. Each is a single-stage, Byron Jackson and pumps 4,000 gpm. at the present dynamic head of 530 feet.



A "shuttle cart" loaded with one ton of uranium-vanadium ore climbs up a 23° incline at one of the mines of the Nielson-Larson Mining Company in western San Miguel County, Colorado. The Diesel electric generating set is shown on the left side of the incline. The trailing power-feed cable from the cart loops into the underground workings and up to the generator.

URANIUM-VANADIUM MINERS UP OUTPUT WITH NEW DIESEL AND ELECTRIC "SHUTTLE CARTS"

Mechanization and low cost uranium-vanadium mining on the Colorado Plateau has long been the goal of mine operators in Colorado, Utah, Arizona and New Mexico. The nature of the ore occurrences has, in many instances, limited output to one-ton-per-man shift with the resultant high mining cost.

Many of the ore bodies are small, irregularly shaped, thin-bedded, and discontinuous so it has been extremely difficult to plan a system of mining where large-size mechanical equipment could be used to an economic advantage. As the rate of diamond drilling has increased, data from drilling has been of greater use in outlining the larger ore bodies and planning the development of a mine.

Ore "Rolls" And Dips

Because the ore "rolls," dips, and skips from bed to bed, its relative position, in a drift, will change from the back to below the bottom in a few feet. Therefore, the use of track and cars is expensive. Much waste has to be mined to maintain grade, and numerous inclines are necessary to follow the gently dipping, usually less than 10°, ore-inclosing sandstone beds. In many places the ore horizon is only a few tens of feet below the surface and the mines are developed through a 20° incline. This permits the use of the same hauling equipment in the mine as that used for transportation up the incline without transferring the ore at the bottom of the incline.

Off-Track Mining

The first system of mechanized off-track-mining introduced in the area was described in the January 1951 issue of *Mining World*.* In this system, Diesel-powered, crawler-type tractors equipped with a front-end loader are used to dig and load the broken ore and waste into cars. Because of its mobility, this type of equipment is also used to transport the material for distances up to several hundreds of feet from the face to the bottom of the main incline. Another important factor in the use of this equipment is the ability to follow the bottom of the ore as it dips and rolls. Sudden changes in grade and direction of the drift or stope floor present no problem in mining or transportation.

"Shuttle Carts" Developed

The success of this off-track mining has now resulted in the development and use of a new type "shuttle cart" for ore transporation. It is a small, low-height, three-wheeled, rubber-tired, self-dumping, Diesel- or electric-powered transporter. It will turn in its own length, obviating long radius curves, and will haul one ton of ore up 23° inclines. The carts are built and marketed by the Wakefield Machine Works at Woods Cross, Utah.

* Haidane, W. E., "Uranium Mining is Primarily a Field For Small Operators," page 28.

LEFT: Dumping waste from a "shuttle cart." Electric power for the unit is supplied through the trailing power-feed cable. RIGHT: A one-ton, 22-cubic-foot box capacity "shuttle cart" is loaded with ore at a western Colorado mine. The cart will haul the ore from the pit up an inclined ramp to the top of a truck loading bin.

Diesel or Electric Power

The Diesel units are powered by a three- to six-horse power engine and burn only three to five gallons of No. 3 fuel oil per hour depending on the grades in the mine in which they are used. A small exhaust gas conditioner is necessary for each unit. Their use has been approved for mines in Colorado and Utah.

The electric-powered units are driven by a two-horse power, AC or DC motor. Electricity is generated by a three KW, or larger, AC or DC Diesel electric generating set located on the surface adjacent to the mine's entrance. A trailing cable is used to transmit power from the generator to the cart. To date, use of the carts has been limited to a 300-foot distance from the generator. Underground speed of the loaded cart is from 150 to 250 feet per minute.

Among those companies which are now using the electric "shuttle carts" are the Navajo Uranium Company at its mines in the Lukachukai Mountains of north eastern Arizona, and the Nielson-Larsen Mining Company at its open pit and underground mines in San Miguel County, Colorado. The photographs were taken at those mines.

The W. R. Bronson Mines is using Diesel units in its mines in western San Miguel County. One unit is in operation hauling ore from the mining face to the bottom of the incline, up the 22° incline, and to the top of the ore bin.

Not Limited To Uranium Mines

While the units have been developed to meet the conditions found in the uranium-vanadium mines, the carts can be used in any mine where the ore bodies are small and scattered and small equipment is necessary for clean mining.

One of the "shuttle carts" at a typical uranium-vanadium mine. Note the steep incline into the mine behind the cart.

John D. Mitchell Tells of

LOST MINES AND BURIED TREASURES

THE BLACK MAVERICK MINE

Back of most lost-mine stories lies a thread of truth. In the telling and re-telling, the mine usually becomes fabulously rich, and new details are added until the historical facts are completely lost, or are so distorted as to have little factual value.

An exception to the rule is the story of the lost Black Maverick. There are people living today who knew Yaqui Valentino, saw the rich specimen of ore he had, and heard from his own lips the story of the discovery. Among those who knew him well are Mr. and Mrs. Henry Hardt of Chandler, Arizona.

It seems that many years ago an Indian cowboy, locally known as "Yaqui Valentino," was riding the range up in the Four Peaks country northeast of Phoenix. On one occasion he was chasing a two-year old black maverick bull through the manzanita and scrub oak that grow profusely on the lower reaches of the Four Peaks. Suddenly, he came out into a little clearing through which trickled a small stream of water. As Valentino entered the open space, the loop of his 60-foot reata spun through the air and landed gracefully around the neck of the racing bull. The trained cow pony sat back on his haunches, the maverick turned a flipflop in the air and landed on his back in a small puddle of clear water.

In his struggle to regain his feet, the bull scoured the sand off of one of the richest specimens of gold ore the cowboy had ever seen.

When Valentino had finished tying and marking the bull, he picked up the piece of rich ore and put it in his pocket. Then, just as he was releasing the maverick, he noticed that his horse was breaking through some rotten timbers into what seemed to be an old pit or mine shaft. He led his horse to safety, then looked the ground over carefully. First, he found the foundations of a cabin with a large tree growing up through the floor. Near-by, was an old rusty pick of the kind used by Spanish and Mexican miners a hundred years ago. It had lain there so long there was little but the eye left. Nothing could be found to identify the former occupants of the abandoned camp.

Shortly afterwards, Valentino left the Four Peaks country to ride for the Bar-T-Bar outfit at Rye. Many old-time cowmen and miners there saw the piece of rich ore and heard Valentino tell the story of his discovery. One old-timer, angered at his failure to get the Indian to show him the mine, is said to have suggested that they force Valentino to take them to it, then shoot the Yaqui and throw his body off the high bluffs into the canyon. A Mexican cowboy happened to overhear the conversation and told the Yaqui to put him on guard.

Some weeks later, two men came into camp and reported that they had found the remains of an old mining camp, one which they believed to be the same as the Indian had discovered. At first, Valentino was very angry. But when he was told the location of the new find he threw his hat into the air and shouted that it could not be his mine for it was many miles away from the place where he had discovered the old camp and the rich piece of quartz.

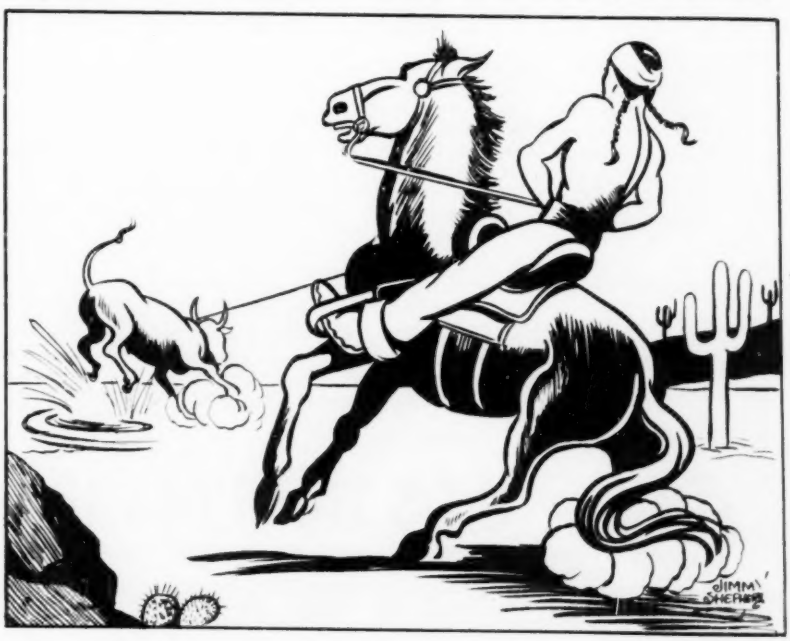
Valentino held Mr. and Mrs. Hardt in high esteem and from all his friends selected them to share in his good fortune by helping him locate and develop the mine. After much talk it was decided that each should have a one-third interest in the discovery and that henceforth it would be known as the "Black Maverick."

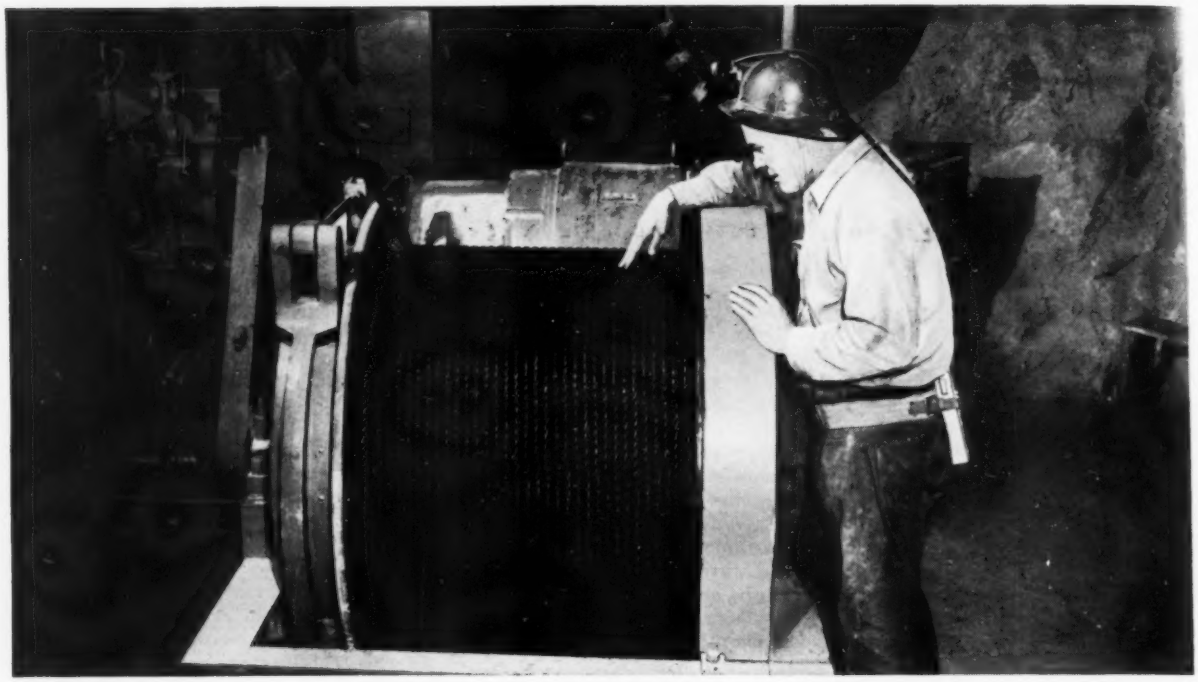
The trip to the Four Peaks country was planned in detail and excitem nt was running high when Valentino came to Mrs. Hardt and told of a very frightening dream he had had the night before. In the dream, he said, he had seen a large number of Apache Indians shooting at him from the top of a high hill near the mine. The Indian was deeply disturbed because he had been taught during his childhood in Sonora that to disclose the location of a lost mine to anyone outside the tribe meant instant death by the gods who rule over the Yaqui people.

Mrs. Hardt explained to him that his fears were based on superstition and that he would not be harmed in any way. She finally convinced him, and the party set forth from Payson for the Four Peaks country.

Continued on Page 100

The maverick turned a flipflop in the air and landed on his back in a small puddle of clear water.

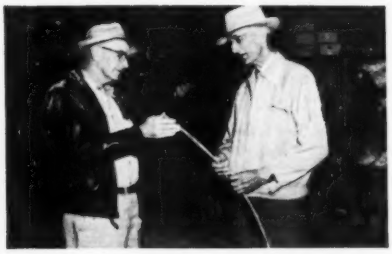




Cables last 6 times longer on this winze hoist in the Seeley Mudd Family's Coronado Copper & Zinc Mine, east of Tucson, since Supt. B. B. Gibbens made changes based on a Tiger Brand Specialist's wear study. Cables now last 18 months instead of three.

Coronado Mine makes big savings with Tiger Brand Rope!

220 tons of ore daily are brought up from the Coronado Mine's Moore Shaft by these Tiger Brand ropes, yet they show only slight wear after almost two years of steady hoisting. One reason the cables have held up so well is that a Field Specialist made sure in advance that they were right for the job they had to do.



"We've saved lots of money with the help of our Tiger Brand Specialist's advice on rope," says Mine Mgr. Fred E. Gray, above left, with Field Specialist J. J. Normart of Tucson. "By recommending the right rope for each job, Mr. Normart has helped us get longer, safer service from our Tiger Brand hoisting cables."

For any mining job you handle, rely on tough American Tiger Brand, the wire rope that's rigidly controlled by United States Steel from raw ore to finished product. To get all the stamina engineered into it, you're welcome to the services of a Field Specialist. Contact your local distributor or write Columbia-Geneva Steel, Room 1422, Russ Building, San Francisco 6.

USS

U·S·S TIGER BRAND Wire Rope

Columbia-Geneva Steel Division, United States Steel Company, San Francisco

UNITED STATES STEEL

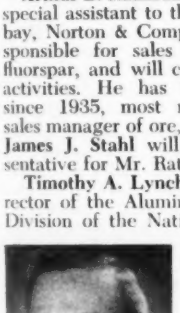
ACTIVITIES OF U. S. MINING MEN

Anaconda Copper Mining Company has made the following management assignments for its new mine-leaching plant project at Yerington, Nevada: A. E. Millar (pictured here) will be general manager, Raymond Burch is to be mine superintendent, and A. J. Gould, plant superintendent. Millar has had many years of experience with Anaconda and Anaconda's subsidiaries, —Chuquicamata, Chile; Cananea, Mexico; Inspiration, Arizona; and for the past number of years has been working directly out of the Anaconda's New York Mining Department office under the direction of Mr. C. E. Weed, Vice President in charge of all mining.

Speakers at the annual meeting of the Mineral Institute Industry scheduled for February 21, at the University of Washington, include **Dr. A. E. Weissenborn,** administrative geologist, U. S. Department of Interior, Spokane, Washington; **Ernest E. Thurlow,** chief of the Spokane Exploration Branch, Atomic Energy Commission; **Dr. John F. Walker,** deputy minister of mines, British Columbia; **A. F. Garcia,** manager of the Kaiser Aluminum Corporation at Tacoma, Washington; and **Dr. J. I. Mueller,** associate professor of ceramic engineering at the University of Washington.

Arthur B. Rathbone has been appointed special assistant to the president of Oglebay, Norton & Company. He will be responsible for sales of ore, alloys, and fluorspar, and will coordinate purchasing activities. He has been with Oglebay since 1935, most recently as assistant sales manager of ore, alloys, and fluorspar. **James J. Stahl** will be the sales representative for Mr. Rathbone.

Timothy A. Lynch has been named director of the Aluminum and Magnesium Division of the National Production Authority. He has been serving since September as acting director, succeeding **Nigel H. Bell.**



CECIL FITCH, JR., vice president and general manager of Chief Consolidated Mining Company, Eureka, Utah, has been elected first vice president of the Utah Mining Association. MILES P. ROMNEY, former executive vice president of the Duvall Company, Cassia county, Idaho, has been named secretary-manager of the Association. Others elected were R. D. Bradford, general manager, western department, American Smelting and Refining Company, as president; J. Parnell Caulfield, general manager Utah copper division, Kennecott Copper Corporation, as second vice president; and A. G. Mackenzie as vice president and consultant.

Chelsea R. Phillips, formerly with Oliver Iron Mining Company, is now in charge of the new Hewitt-Robins, Inc. office in Hibbing, Minnesota.

O. W. Bilharz, president of the Bilharz Mining Company, one of the larger independent producers in the Tri-State district, has been re-elected president of the Tri-State Zinc and Lead Ore Producers Association at a meeting held recently in Baxter Springs, Missouri. **Elmer Isern** was elected first vice president; **Fred J. Childress,** second vice president; and **Harold A. Krueger,** treasurer.

E. P. Chapman, Jr. is the new president of the Albuquerque chapter of the New Mexico Mining Association. Other new officers are **George A. Warner, G. R. Griswold,** and **William A. Gunnell,** first, second, third vice presidents, respectively; and **Bessie Pardis,** secretary-treasurer.

Marvin Chase, formerly mine engineer with the Pend Oreille Mines and Metals Company in Metaline Falls, Washington, is now shift boss for the American Zinc, Lead, and Smelting Company at its Grandview mine in the same district.

Thomas N. Peck has been appointed deputy director of the aluminum and magnesium division of the National Production Authority. He was formerly director of the aluminum alloy division of Vanadium Corporation of America. Mr. Peck succeeds **Timothy A. Lynch** who is now director of the aluminum and magnesium division of the National Production Authority.

Quenton Brewer, mining engineer of Auburn, California, has accepted a position with the exploration department of the DMA in Washington, D. C. Mr. Brewer has been located in Auburn for the last 20 years and is a graduate of the Colorado School of Mines.

The Bishop Mining Engineers met recently in Bishop, California to formulate plans for future meetings. Those attending the first meeting included **R. Carpenter, J. Emerson, L. Holberg, M. Peters, M. Pembridge, T. Holmes, W. Witt, L. Wright** of U. S. Vanadium, **G. Hartley** of Blue Ridge Mining Company, **W. E. Sands** of Black Rock Mining Corporation, and **H. Bates** of the Los Angeles Department of Water and Power.

Ralph L. Wilcox is now with the sales department of the American Smelting & Refining Company in New York City. He was formerly with the United States Economic Cooperation Administration. Mr. Wilcox previously served with the International Materials Conference, Gerrity Michigan Corporation, the New Jersey Zinc Company, and the War Production Board.

George A. McHugh has been named superintendent of the J. R. Simplot mining operations and, for the present, will devote most of his time to the Palisades iron development and to uranium exploration in northern Nevada. Mr. McHugh has been with the Simplot interests since 1946 when he assisted in opening the phosphate mines. The Simplot firm operates phosphorus mines in southeastern Idaho, iron mines at Palisades, Nevada,

L. J. RANDALL (LEFT) has been named president of Hecla Mining Company, and R. W. NEYMAN (RIGHT) its general manager. Mr. Randall has been with the company since 1948, serving as secretary-treasurer and comptroller. He was at one time secretary-treasurer and assistant to the general manager of Coeur d'Alene Mines. Mr. Neyman moves up from the position of general superintendent. Since he joined Hecla in 1930, he has specialized in mechanical problems, and has been responsible for many improvements in the North Idaho operations of the firm.

as well as various smaller non-ferrous metal mines throughout southern Idaho.

E. W. Claar, director of the Central Ohio chapter of the American Foundrymen's Society, was recently named manager of Eastern Clay Products Department of International Minerals & Chemical Corporation. Mr. Claar was formerly central district manager of Eastern Clay Products, Inc. and will, for the present, remain in Jackson, Ohio.

R. H. Miller has been appointed general superintendent of the American No. 1 custom mill of the American Zinc, Lead and Smelting Company at Ouray, Colorado and the Caledonia mine in San Juan County, Colorado. **R. H. Wilhelm** is mill superintendent at Ouray.

The American Smelting & Refining Company has promoted **D. R. Purvis,** mine superintendent of its Ground Hog unit at Vanadium, New Mexico to the position of general superintendent. He replaces **T. A. Snedden** who will be in charge of ASARCO's new Silver Bill open-pit copper mine and flotation plant now being developed 40 miles from Tucson, Arizona. **G. J. Mathews** has been promoted to mine superintendent of the Ground Hog unit.

J. C. KINNEAR, vice president in charge of Kennecott Copper Corporation's far-flung mining operations, retired January 1. Mr. Kinnear had been associated with Kennecott interests for 41 years. He joined the Nevada Consolidated Copper Company in Ely, Nevada, in 1910. When the firm was acquired by Kennecott, he was named general manager of the mining, milling, and smelting operations in the Ely area. He was appointed general manager of the Nevada Mines Division in 1927. He held that position until 1945 when he was moved to the New York office as vice president.

Wesley P. Goss, manager of Magma Copper Company, Superior, Arizona, was named chairman of the Arizona Section, American Institute of Mining and Metallurgical Engineers, at the organization's annual meeting. Other officers include: **Lyle Barker,** Morenci, first vice-chairman; **J. S. Richards,** Tiger, second vice-chairman; and **J. F. Buchanan,** Superior, secretary-treasurer.

John Hamm, well known Colorado mill and mine operator, is now living in Salt Lake City, Utah, where he is metallurgical engineer for the Western Machinery Company of San Francisco, California.

M. A. Kuryla, has been appointed industrial relations manager, western division, United States Smelting Refining & Mining Company. Mr. Kuryla joined the company in 1937 and has worked in their Bingham and Lark mines. He has also been assistant mill superintendent at the company's Mexico properties, and industrial relations engineer for western operations in Salt Lake City.

Claud M. Wolgamott is now superintendent of the Black Rock Desert Minerals Company at Sulphur, Nevada where he is in charge of mill construction for a new sulphur grinding and sacking mill. He formerly was foreman of the Calivada Development Company, Garden Valley, California.

C. N. Kravig has succeeded **Ed Ross** as mine superintendent of the Homestake Mining Company at Lead, South Dakota. Mr. Kravig has been assistant mine superintendent since 1940. Mr. Ross retired after many years employment by the company. **Bill Campbell,** formerly chief mine surveyor and mine engineer, has been promoted to assistant mine superintendent replacing Mr. Kravig.

Dr. Robert J. Anderson has left t Light Metals Division of the Natio Production Authority in Washingt D. C., and has joined the Southwest R search Institute in San Antonio, Texas.

L. W. Spang has been appointed sec tary of the M. A. Hanna Company, filli the post left vacant by the late **William Scott.** Mr. Spang joined the Hanna orga zation in June 1950 as assistant couns relinquishing his partnership in a Dulut Minnesota law firm.

John R. Harmon is now with the Stand ard Slag Company in Gabbs, Nevada, a a chemist. He had formerly been with th London Extension Mining Company i Beowawe, Nevada.

Dr. Kent R. Van Horn has been named Aluminum Company of America's director of research. A veteran of 22 years with Alcoa, Dr. Van Horn will succeed Dr. **Francis C. Frary** who is retiring. Dr. Van Horn, formerly associate research director, is considered an authority on industrial x-ray. He is also one of the country's leading research metallurgists.

Walter L. Patty has joined the staff of the Seattle district, Explosives Department, E. I. duPont de Nemours and Company, Inc. as technical service representative. He has been with this branch of the company for the past three years, spending most of his time in Missouri.

Herman J. Gemuenden has been appointed director of industrial relations for the mining operations of Oglebay, Norton and Company in the Lake Superior region. He will work from the Duluth office of the company and direct the personnel and industrial relations functions of the company in its capacity as operating agent for the Montreal Mining Company, the Reserve Mining Company, and the St. James Mining Company.

Hollis M. Dole, geologist for the Oregon State Department of Geology and Mineral Industries Industries, has been granted a leave of absence to do graduate work at the University of Utah.

Vincent G. Rumpf, graduate of New Mexico School of Mines, formerly with the U. S. Army Corps of Engineers, is now associated with Telluride Mines Inc., Telluride, Colorado, as a mining engineer.

Whitman G. Rouillard, manager of operations at the Garfield Smelter of the American Smelting and Refining Company, has been elected chairman of the Utah section of the American Institute of Mining and Metallurgical Engineers. He succeeds **Carlos M. Bardwell. Clark Wilson,** superintendent of mines for the New Park Mining Company, was elected vice chairman, and **Harry Allen** of the same company was reelected as secretary.

James D. Ireland has been elected a director of Cleveland-Cliffs Iron Company. He succeeds **George B. Young.**

Duane Myers has been appointed superintendent of the Hiawatha iron mine of The M. A. Hanna Company on the Menominee Iron Range, succeeding **R. B. Wortley** who has retired. **Leonard Morgan** has been appointed supervisor of mobile equipment at the Minnesota operations of Hanna.

Robert F. Anderson, of Hibbing, Minnesota, has been appointed assistant superintendent of the South Agnew and Morton mines operated by the M. A. Hanna Company. He was a pit foreman at the South Agnew mine at the time of his promotion.

Del F. McNamara has been named assistant to the manager of the Duluth, Minnesota, branch of the William H. Ziegler Company.

ACTIVITIES OF INTERNATIONAL MINING MEN

BRIGADIER GENERAL WILLIAM W. WANAMAKER, U. S. Army, retired has been appointed chief engineer of the Orinoco Mining Company, a United States Steel Corporation subsidiary. He will divide his time between the iron ore concessions of Orinoco in Venezuela and the firm's New York offices. General Wanamaker retired from the Corps of Engineers in 1949 to become the first executive director of the New Jersey Turnpike Authority. He resigned this post following dedication of the $255,000,000 turnpike to accept his present position.

R. G. LeTourneau, president of R. G. LeTourneau, Inc., manufacturer of heavy construction equipment, departed recently for Liberia accompained by a team of LeTourneau technicians. The party plans to attend the inauguration ceremonies to be held in Monrovia, to inspect the country of Liberia, and to consult with Liberian engineers on the development of its roads, lumber, mining and natural resources. Mr. LeTourneau will examine Liberia in the light of the Point IV Program, and has consulted with United States State Department officials on the development of less progressive countries encouraged by this program.

Carlos Dworjack, formerly master mechanic of the Hong Kong Mines, Ltd. of Hong Kong, has joined the staff of Frontino Gold Mines, Ltd., in Colombia as mill shift boss. **Francisco Reyes,** previously with the Choco Pacifico, has joined the same company as safety engineer.

C. E. White has been named district superintendent of mines, North Central District, Consolidated Mining and Smelting Company of Canada, Ltd. and will be in charge of all mining operations in the North Central District, with particular emphasis on the Con Mine and the development of the Pine Point Property. Mr. White has been with Cominco for a number of years and prior to this appointment was property superintendent of the Con Mine.

Robert Y. Grant has left the United States for Formosa where he will serve on the staff of the Economic Cooperation Administration working on mine rehabilitation. Prior to his Formosa position, he was chief of the Mining & Geology Division, Natural Resources Section, SCAP, Tokyo, Japan.

F. R. Brooks is now manager of the Rhodesian Copper Ventures, Ltd. in Salisbury, Southern Rhodesia. Mr. Brooks was formerly with the Mufulira Copper Mines in Northern Rhodesia in the capacity of manager.

A. L. Job has recently moved from the Malay States to Uganda, Eastern Africa, where he is now inspector of mines. Mr. Job was previously with the Gopeng Consolidated, Ltd. in Malay.

F. Bice Mitchell has been appointed vice principal of the Cambourne School of Mines, Cornwall, England. He will continue as head of the school's mineral dressing department. He is an international authority on tin metallurgy and made an extensive tour of mining and metallurgical plants in the United States during 1951.

Nick J. Hurley, formerly general manager of Bolivian Tin and Tungsten Mines Corporation, one of the Patino Mines and Enterprises Consolidated's operations, is now with Frontino Gold Mines, Ltd., Colombia, as mine superintendent. During the recent sick leave of **H. I. Altschuler,** he was in charge of all operations.

Manuel Villafana, chairman of the Mining Development Commission, is making a two-months tour of United States' mining zones to observe opportunities for collaboration between the United States and Mexico under the Point IV Program. Mr. Villafana's tour is part of the technical cooperation program in which the United States and Mexico are participating under an agreement made by the two governments in June, 1951. Mr. Villafana has had former experience in Mexican mining with private companies, chiefly as consulting engineer and general superintendent.

GEORGE C. FLOYD has been elected vice president of Vanadium Corporation of America. Since 1947, he has been vice president—operations of Thomas Steel Company. Previously, Mr. Floyd was plant manager of the West Leechburg Works of the Allegheny-Ludlum Steel Corporation, a stainless steel metallurgist for Republic Steel Corporation, and an instructor of analytical chemistry at Cornell University.

B. E. Hurdle has been appointed general superintendent of the Kimberly Operation of the Consolidated Mining & Smelting Company of Canada, Ltd. Mr. Hurdle has been with Cominco for a number of years working at the Box Mine in Saskatchewan, the Con property at Yellow knife, the Thompson Lundmark Mine, and the Trail office. He has served as assistant to the general superintendent of exploration and assistant to the manager of mines.

Vance R. Fenton is now general manager of Las Playas Mining and Development Corporation, a subsidiary of Callahan Zinc-Lead Company. He was formerly general manager of International Mining Corporation's Colombian interests.

John B. Lewis, mining engineer of Seattle, Washington has accepted an appointment with the Bureau of Mines to work on a Point IV project in Colombia as coal mining engineer He recently returned from Japan where he was with the Mining and Geology Division Natural Resources Section GHQ SCAP.

L. S. Breckon, western field engineer for Kennecott Copper Corporation has been promoted to district geologist with headquarters in Sydney, Australia. Mr. Breckon's function will be to keep Kennecott abreast of geological and minerals explorations in the Far East and Australian areas.

CHARLES A. R. LAMBLY has been named assistant manager of American Metal Company, Limited's mining department. His headquarters will be in New York but he will spend most of his time observing the company's holdings in the United States and abroad. Mr. Lambly had been general superintendent of the Pend Oreille Mines and Metals Company in Metaline Falls, Washington, and general superintendent of the Reeves-McDonald mine in British Columbia.

L. R. Nielson, who has been in Colombia since 1946, is returning to the Orient to attend to his many mining operations. Mr. Nielson is well known throughout the Orient for the prewar growth and success of his mining company, Nielson and Company, Inc. Through this company, many mines such as Lepanto, Paracale Gumaus in the Philippines, and Hong Kong Mines were brought from undeveloped properties into dividend payers with some of these companies maintaining dividend payments as high as five percent per month.

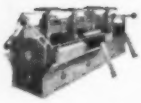
M. S. Krishnan has been appointed mining engineer at the Ghatkuri Iron and Manganese Mines in the Singhbhum district of Bihar, India.

J. Howard Heginbotham of Salt Lake City, Utah is now in New Caledonia as chief engineer in the development of a chromite mine and a mill to concentrate the ore. Mr. Heginbotham, who was consulting engineer and equipment manufacturer in Salt Lake City, plans to be gone for two years. This project, sponsored by the New Caledonia Metals Company, also employs two other Salt Lakers—**J. Wilford Patterson,** general manager of the operation, and **S. W. Norton,** resident manager.

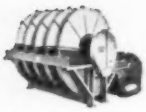
Antonio Uribe, mining man of Medellin, Colombia, has recently returned from Peru where he was on a mine project for an United States company.

Dramawan Mangunkasuma heads an Indonesian tin mission which recentyl arrived in the United States. **Ismail Thajeb,** economic counsellor of the Indonesian Embassy in Washington, and **Miss T. H. Meijers,** Trade Commissioner in the United States, will also attend the conferences of the mission.

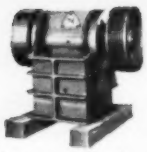
FREDERICK W. HOLSHUHER has been appointed controller of the Cerro de Pasco Corporation in Peru. Mr. Holshuher, who just recently joined Cerro, had been associated with an industrial consulting firm operating gold mines in the Union of South Africa. Before that, he had been controller of Hills Brothers Company.



Denver "Sub-A" Flotation



Denver Disc Filters

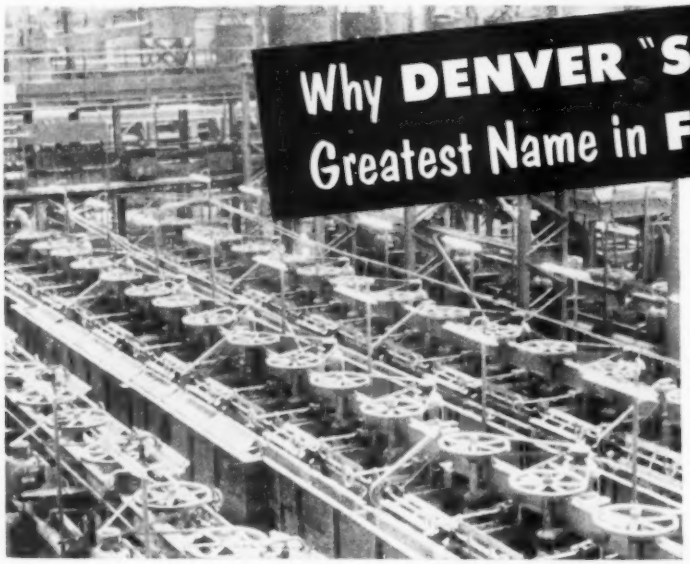


Denver Jaw Crushers

Denver Steel-Head Ball Mills

Denver-Dillon Vibrating Screens

Why DENVER "SUB-A" is the Greatest Name in FLOTATION



This copper concentrator made exhaustive tests—erected a 500 ton per day pilot plant; compared flotation machines. These tests proved Denver "Sub-A" greatness. They now have 32 No. 24 and 120 No. 30 Denver "Sub-A" Flotation Cells treating 5000 tons of copper ore per 24 hrs.

Proof of Denver "Sub-A" greatness is the fact that over 33,000 Denver "Sub-A" Flotation Cells are serving around the world!

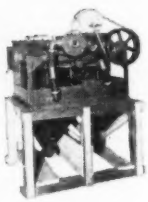
Moreover, there are more Denver "Sub-A's"—*probably more than all other Flotation Machines combined*—because Denver "Sub-A's" are the very best! This is an important fact. It has been proved many times by competitive tests.

Tests, like those conducted by the large copper concentrator pictured above prove that comparing capacity for capacity, horsepower for horsepower, cost per ton of ore processed and smelter receipts for concentrates produced, DENVER "SUB-A's" *are best by a very substantial margin.*

This copper concentrator tested many different flotation machines. The net result—*and it is the NET RESULT that means profits*—was definitely in favor of Denver "Sub-A" Flotation.

DENVER "Sub-A's" are standard flotation machines, flexible to meet changing conditions of your ore. They are built to give mill operators those tools needed to get results that pay greatest profits.

Denver Super Agitator and Conditioners



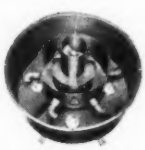
Denver Selective Mineral Jigs

Denver-Buckman Concentrators

FACTS about the Leader

Denver Thickeners

In 25 years DECO has pioneered practically every major improvement in Flotation. Denver "Sub-A" was first with low-head design, steel tanks, molded rubber wearing parts, supercharged aeration and many more features of flexibility that improve metallurgy and simplify mill operation.



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INTERNATIONAL NEWS

Zinc, Copper Allocated By IMC For First 1952 Quarter

The governments of the member countries (Australia, Belgium, Canada, Chile, France, Federal Republic of Germany, Italy, Mexico, Norway, Peru, United Kingdom and the United States) of the Copper-Zinc-Lead Committee of the International Materials Conference have allocated zinc and copper for the first calendar quarter of 1952 as shown in the following table.

Zinc has been allocated on the same basis of total Free World estimated production, except for strategic stockpiling, that was done in the fourth quarter of 1951. No provision was made in the copper allocation for strategic stockpiling.

The Chilean government accepted the Committee's resolution for distribution of 80 percent of the production of the larger mines but retained the right to distribute the remaining 20 percent together with all production from small and medium mines as it deemed desirable.

First Quarter Allocations

Country	Zinc (Metric Tons)*	Copper
Argentina	2,500	2,100
Australia	13,000	12,500
Austria	2,000	3,000
Belg.-Luxembourg Econ. Union	26,000	20,200
Brazil	1,900	4,800
Canada	15,000	31,500
Chile	1,100	2,300
Cuba	20	50
Denmark	1,550	3,900
Egypt	350	1,300
Finland	1,050	2,450
Formosa		70
France	29,000	38,000
French Africa	160	1,650
Germany, Federal Republic of	41,000	51,000
Greece	250	1,050
India	6,000	8,800
Indonesia	20	60
Ireland	80	50
Israel	100	100
Italy	9,000	24,500
Japan	12,000	15,000
Korea		120
Mexico	3,850	3,500
Netherlands	6,000	7,000
New Zealand	400	80
Norway	3,400	4,100
Pakistan	300	1,700
Peru	300	200
Philippines	50	
Portugal	220	650
South Africa, Union of	3,500	5,000
Spain	4,050	4,900
Sweden	5,550	13,100
Switzerland	2,700	6,400
Turkey	50	1,500
UnitedKingdom	64,000	100,000
United States	229,000	366,000
Uruguay	100	100
Yugoslavia	2,100	5,950
Totals	487,650	744,680

* 2,204.6 pounds.

Anglo American Forms New Technical Committee

The Anglo American Corporation of South Africa, Limited, has formed a Technical Development Committee to put into use the latest engineering developments that may be applicable to the special requirements of the various operations of the firm.

Membership in the committee includes Anglo American's consulting engineers, consulting mechanical and electrical engineers, and consulting mechanical engineers, with an independent technical executive as committee chairman. Meetings are held once a month to discuss suggestions for new types of plants and equipment. It brings to the attention of management, problems in methods and equipment that require investigation, directs the general form which the work is to take, and discusses matters of policy that can affect the progress of technical development.

In carrying out these functions, the committee has the assistance of the recently formed Technical Development Section of the firm's engineering department. The Technical Development Section is presently working on the possibility of utilizing waste heat produced or encountered in the course of various mining activities, and the development of new methods to increase the efficiency of cooling arrangements for mines where high rock temperatures are encountered.

Bolivian Tungsten Mines Get Million-Dollar Loan

A loan of $1,000,000 to the Bolivian Tin & Tungsten Mines Corporation has been approved by the Export-Import Bank. The money will be used to assist in the expansion of tungsten production from the Kami mine in the Province of Ayopaya and the Araca mine in the Province of Loayza in Bolivia. Both are said to have extensive ore reserves and have been tungsten producers for a number of years.

The operators have agreed to sell to the United States Emergency Procurement Service the tungstein to be produced during the years 1952 to 1957. Terms of the credit require that if not previously liquidated by repayment resulting from shipments to Emergency Procurement Service, repayment of principal will be made in six semi-annual installments, beginning in June 1954.

1951 Nickel Production Increases 10 Percent

The free world's production of nickel for 1951 totaled approximately 295,000,000 pounds, an increase of more than 10 percent over 1950, according to Dr. John F. Thompson, chairman and president of The International Nickel Company of Canada, Limited.

Canadian producers were responsible for 275,000,000 pounds, or more than 90 percent, of this total. In 1950, Canada produced 247,000,000 pounds of nickel in all forms. The outlook for the future is even more promising.

International Nickel's current rate of production is 252,000,000 pounds annually. The company is pushing its long-range underground mine development program which, when completed in 1953, will give the company the largest non-ferrous base metal underground mining operation in the world.

Falconbridge Nickel Mines Limited, Canada's second largest nickel producer, has embarked on an expansion program which its official estimate will increase production to 40,000,000 pounds of nickel annually, and will require about three years to complete. Annual output is now about 25,000,000 pounds.

Plans of Sherritt Gordon Mines Limited are said to call for initial production from its deposits in the Lynn Lake area of Northern Manitoba by the end of 1953. Annual capacity of 17,000,000 pounds of refined nickel is expected to be reached by 1955.

Mining of English Iron Ore Being Increased

The difficulty of importing iron ore into Great Britain is leading to increased mining of ores in the Oxfordshire-Northamptonshire-Lincolnshire belt of England. This may relieve the shortage to some extent but the quality of the local ore is not considered good. English ores have an iron content of between 20 and 30 percent, compared with the 50 percent of the richer, imported ore.

Production from the O-N-L belt during 1950 amounted to 13,000,000 tons of ore. It had been hoped that this might be raised to 15,000,000 tons during 1951. The diversion of ore boats to coal shipping resulted in a deficiency of about 600,000 tons.

The low-grade ore lies at different depths—in the Stewart and Lloyds workings, down as far as 220 feet which will necessitate some underground mining. The huge new dragline, built by Ransomes and Rapier and claimed to be the biggest in the world, was recently put to work there. It excavates to a record mine depth of 100 feet which will obviate underground mining for the time being.

Malayan Tin Production Threatened By Turmoil

The United States Tin Mission to Malaya reportedly found that the communistic situation in the country is serious and the recent murders of high officials may indicate a turn for the worse.

The Mission found that tin production is being maintained with 82 dredges, 593 gravel pumps, and 76 other units, employing 45,686 workers. During the first nine months of 1951, output was 42,490 tons of tin metal, compared with 57,537 tons for all of 1950. During this period, the United States bought only 2,532 tons of tin, compared with 44,590 tons in 1950.

This production is being maintained under conditions of great danger, behind fortifications patrolled by special constables, usually hired at the mining firm's expense. Some dredges have been closed down completely because of successful bandit activity. Prospecting for new tin-bearing areas has ceased because of the lack of security and is not likely to be resumed for some time.

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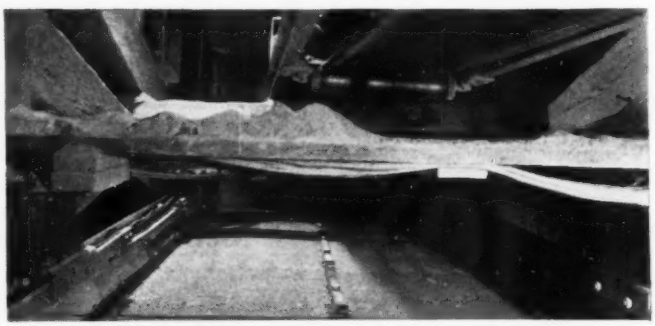
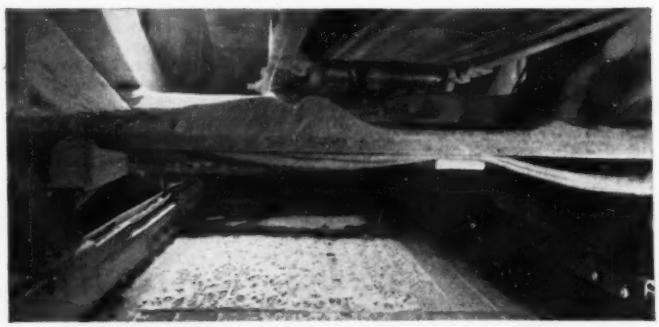


POWER ON — *Thermo-Deck* heating unit keeps screen cloth clear on screen handling pulverized limestone.



POWER OFF — Troublesome blinding results on same screen when *Thermo-Deck* heating unit is turned off.

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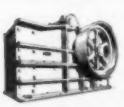
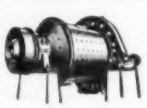


Jaw Crushers

Gyratory Crushers



Grinding Mills

Vibrating Screens

Kilns, Coolers, Dryers

IMC 1952 Quotas For Tungsten and Molybdenum

The 13 member countries (Australia, Bolivia, Brazil, Canada, Chile, France, Federal Republic of Germany, Japan, Portugal, Spain, Sweden, United Kingdom, and United States) of the Tungsten-Molybdenum Committee of the International Materials Conference have announced allocation quotas for tungsten and molybdenum for the first calendar quarter of 1952 as shown in the accompanying table. Increases in production of both tungsten and molybdenum has permitted increased allocation of both metals over that of 1951 quarters.

The Committee hopes that a firm six months' plan of distribution be adopted not later than March 1, 1952 at which time the present provisional allocation will be merged with the new plan.

First Quarter Allocations

Country	Tungsten (Metric Tons)*	Molybdenum (Metric Tons)*
Argentina	0.5	0.5
Australia	18.0	...
Austria	7.0	...
Belgium	3.0	...
Canada	28.0	...
Chile	0.2	0.25
France	323.0	239.0
Germany	348.0	157.5
Italy	23.0	20.0
Japan	103.0	40.0
Netherlands	9.0	5.0
Spain	16.0	...
Sweden	232.0	109.0
United Kingdom	779.0	545.0
United States	1,748.0	3,644.0
Reserve	62.3	40.25
Total	3,700.0	4,800.0

* 2,204.6 pounds.

Kyanite Deposit Reported In Africa

A promising kyanite deposit has been developed about eight miles from Francistown in the Tati Territory of Bechuanaland Protectorate, Africa. About 1,400 tons has been shipped to various parts of the world during the last six months.

One important feature of the deposit is that high-grade kyanite has been disclosed in a crosscut 100 feet below the outcrop.

The pegging of claims for other metals in the area, including antimony ores, has shown a marked activity during recent months.

Anaconda Schedules First Aluminum For 1952

The proposed 72,000-ton-per-year, three-potline, primary aluminum production plant at Kalispell, Montana, has received the support of Defense Production Administrator Manly Fleischmann.

The plans of Anaconda Copper Mining Company and Harvey Aluminum Company, a subsidiary of Harvey Machine Company of Torrance, California, had been opposed by the United States Departments of Justice and the Interior. Both had contended that the entrance of Anaconda into the primary aluminum field would tend to discourage competition.

Mr. Fleischmann believed that it was in the Government's interest to support Anaconda, since it was the quickest way of adding an appreciable amount of metal to the country's supply. He rejected claims that it would be to Anaconda's advantage to discourage substitution of aluminum for copper.

The Department of the Interior has been ordered to supply electric power to the new plant from Hungry Horse Dam. The power will be available by October or November of 1952 and one of the new potlines may be in operation by that time, with two others following at from 45- to 60-day intervals.

The Government will grant Anaconda and Harvey rapid tax write-offs on 85 percent of a total investment up to $94,700,000.

SOUTH AFRICA—*South African Manganese Ltd.* reports that it has entered into contracts for the export of its ore to overseas buyers at improved prices during 1952. Attention is now being given to acquiring additional properties and the company's geologist is now prospecting new fields.

TANGANYIKA—The British Government's *Colonial Corporation* is prospecting in the Tanganyika Territory for deposits of tin and tungsten. Reports of deposits containing both strategic metals have been indicated in the Bukoba district.

NORTHERN RHODESIA—The *Rhodesia-Katanga Company, Ltd.* has announced that an agreement has been reached for the financing of a deep drilling program at the *Kansanshi* copper and gold mine in partnership with an under the technical supervision of the *Anglo-American Corporation of South Africa, Ltd.*

SOUTH AFRICA—At the Gravelotte section of the *Consolidated Murchison* mine further development has continued to expose antimony ore of high grade. The extent of the deposit, as now known, seems to indicate that a supply of ore to meet present demands is assured for some years.

TUNISIA—Phosphate output is to be extended by the GAFSA French group in a new plant being built at Redeyef and in a pilot plant at Metlaoui which is to try new electrostatic and flotation processes. If the processes succeed, a large plant costing $450,000 will be built at Metlaoui.

UGANDA—*Colonial Development Corporation* is prospecting for tungsten in the Karagwe tin fields.

SOUTH WEST AFRICA—A new company, *New Nchanga Base Metal Corporation Ltd.*, has acquired the sole and exclusive prospecting contract and option over the Itah copper mine in the district of Luderitz, three other base mineral claims in that district, and three in the district of Bethanie. Negotiations are being carried on with *The Standard Ore and Alloys Corporation* of New York which is reportedly interested in joint operation of the Itah mine.

HIGH-GRADE CONGO COPPER MINE

Scene of intense mining expansion among the various Union Miniere du Haut-Katanga open-pit operations near Kolwezi in the Belgian Congo is the Ruwe mine, a high-grade copper (malachite) property. The mine has been modernly equipped with American machinery, including the Austin-Western dump cars, and Westinghouse electric locomotive with Ohio Brass electric trolley installations seen above. Mining is conducted with Bucyrus five-yard shovels manned by well-trained native operators. In production for about a year and a half, the ore body is a basin-like deposit estimated to be roughly 40 meters thick over an area some 500 by 750 meters. A total of 11,000,000 cubic meters of overburden have been stripped to date. Current production from the property is 100,000 tons monthly, shipped to the concentrator at Kolwezi. M. P. Donnay is manager of the property. Photo was taken by M. F. Holsinger, general manager of *Mining World*, during his recent tour of the Elizabethville-Jadotville-Kolwezi area in the Belgian Congo.

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BELGIAN CONGO—Total copper output of *Union Miniere du Haut Katanga* for 1951 was about 185,000 tons. This exceeded that of 1950 by about 10,000 tons. The increase was obtained, in part, by the commissioning of the third group at the Bia power station, the extension of the copper and cobalt electrolysis plant at Jadotville, and the extension of the Kolwezi concentrator. Work is progressing on the Delcommune power station and on a survey of a proposed fourth power station, Le Narinel Station on the Lualaba River. Native workers have been granted salary raises in relation to their efficiency and seniority.

NORTHERN RHODESIA—*Rhokana Corporation, Ltd.* produced 82,958 long tons of copper in 1951, 2,883 tons more than the previous year. Production of cobalt from the new electrolytic plant is expected to begin early in 1952. *Rhodesia Copper Refineries, Ltd.* is installing vertical casting equipment so that a proportion of the output will be produced as special shapes and grades of copper for the company and for *Nchanga Consolidated Mines Ltd.* Partial operation of this phase should begin in the third quarter of 1952. Improvements are under way in plant design and operating methods. Early in 1952, the power plants of the four large copper mining companies will be inter-connected to reduce individual mines' requirements for stand-by plants. Concerned in the arrangements are *Mufulira Copper Mines, Ltd., Roan Antelope Copper Mines, Ltd., Nchanga Consolidated Copper Mines, Ltd., and Rhokana Corporation Ltd.*

SOUTH AFRICA—Allanridge, the most northerly township of the Free State goldfield, serving the *Loraine* and *Jeannette* gold mines, has grown to more than 1,200 Europeans and 3,700 natives in 12 months. Equal progress is being made in the development of the two mines. Only a year ago, the Loraine was in the early stages of shaft sinking. Today its two shafts have reached a combined depth of more than 2,500 feet. The Jeannette gold mine company had not yet been formed. Today, it is the only mine of the *Anglo American Corporation's* Free State mines to have a twin circular shaft.

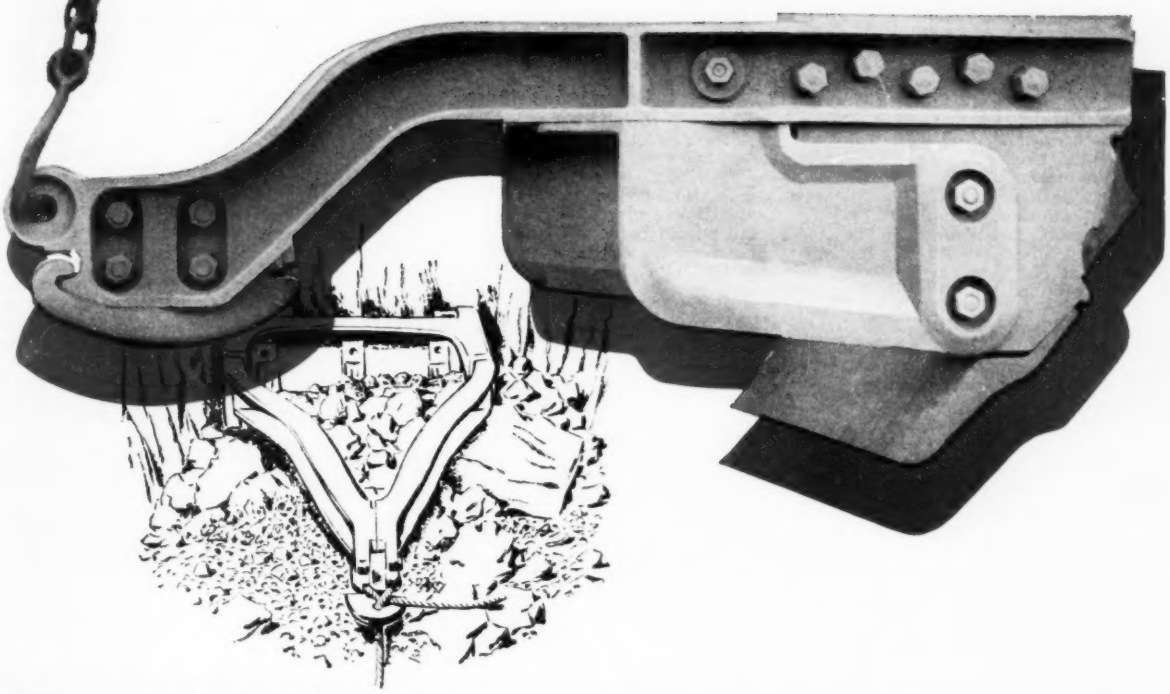
SOUTH WEST AFRICA—During the past year, *Industrial Diamonds of South Africa (1945) Ltd.* stripped 743,100 loads of overburden from its property at Saddle Hill, 48,356 carats were recovered. The difficult task of removing sufficient quantities of overburden in order to expose enough terrace material for the washing plant has been made more difficult by the increased depth of the overburden. The average depth of 20 feet last year is 75 feet this year. In addition, half of the equipment has lain idle because of the international situation. New earth-moving equipment, capable of handling 250 loads per hour, is now being assembled at the mine. The company has received from the *Diamond Mining and Utility Company (SWA) Ltd.* the exclusive right to carry on prospecting and mining operations over a vast coastal area of 8,000 square miles, known as *Diamond Area No. 2.* Diamond Mining and Utility will be entitled to 20 percent royalty on the net proceeds from the sale of all diamonds recovered.

TUNISIA—Lead ore production in September was the highest since 1928. 3,077 tons were mined, compared with 2,681 tons in August. During the first nine months of the year, output totaled 24,562 tons against 22,566 tons during 1950. The amount of soft lead produced during the period was 17,807, against 16,873 tons.

SOUTH AFRICA—*Blyvooruitzicht Gold Mining Company Ltd.* reported that for the fiscal year ended June 30, mill tonnage was higher by 167,000 tons and total gold recovered was higher by 88,090 fine ounces. The footage sampled on the Carbon Leader amounted to 20,620 feet, of which 97.9 percent was classified as payable and averaged 2.525 ounces of gold per ton over a channel width of 12 inches. This represents a substantial improvement over results of the preceding year; however, a considerable amount of subsidiary development was undertaken in faulted zones where values were high and the tonnage developed was limited. Consequently, the total available ore reserve fully developed at the end of the year amounting to 5,517,000 tons, showed a decrease of 443,000 tons, while the value at 13.0 dwt per ton was lower by 0.1 dwt. Expansion of the reduction plant to treat 120,000 tons per month has been completed.

SOUTH WEST AFRICA—*Lithium Mines (Pty) Limited* is increasing production of lepidolite to 2,000 tons monthly from its pegmatite deposits in South West Africa. The lepidolite contains between three and four percent

Another example of how AMSCO Manganese Steel can help you profitably fight wear.



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One of the toughest mining operations you'll find anywhere—tough from the standpoint of how it punishes equipment—is scraping heavy, corrosive pyrite ore. For example, a California mine has a deposit of 98% pure pyrite—with a specific gravity of 4.8. Impacts and abrasion caused by this ore were making short work of the scrapers previously used . . . on the average they needed major repairs over 4 times per year.

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Obviously, not all mining or excavating operations are as equipment-punishing as this one . . . *but the moral is clear . . .*

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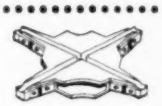
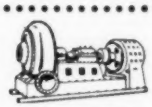


Transportation

Crushing and Pulverizing



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TANGANYIKA—Dr. John T. Williamson, owner of the Williamson diamond mine at Mwadui, Shinyanga has announced that all diamonds from the mine may soon be sold on the open market as he has refused to agree to renew his agreement to sell his diamonds through the Diamond Trading Corporation. Production from the Williamson mine has been selling at about $8,400,000 per year through the Trading Corporation which is controlled through the De Beers diamond interests. Twenty Europeans and 3,500 natives are now employed by Williamson.

NORTHERN RHODESIA—*N'Changa Consolidated Copper Mines Ltd.* is investigating the possibility of reopening the old *King Edward* mine, 30 miles west of Lusaka, to extract copper and sulphur.

BRITISH COLUMBIA—*Black Diamond Tungsten Limited* is developing a new tungsten mine 10 miles from Atlin with an exploration program aimed at blocking out enough ore to start production in the spring. Atlin is about 10 miles from the Yukon border. A camp for 20 men has been built and machinery and supplies have been moved into the area.

ONTARIO—The *Construction Agglomerates Corporation* of Chicago, Illinois, has completed the first year of its large contract to strip the overburden from *Steep Rock Iron Mines Limited's* "A" orebody, using a hydraulic dredge. Clyde Davis was recently appointed general superintendent at Steep Rock for the construction company.

QUEBEC—*Bargis Mines Ltd.* is preparing to carry out a drilling program on its 400-acre silver-zinc prospect about 10 miles from Barraute. A drilling contract has been let and three holes have been spotted. C. H. M. Reid is president of the firm.

BRITISH COLUMBIA—*Thomas Consolidated Mines, Inc.*, of Spokane has opened an ore body at its *War Horse* mine near Kimberley, B. C., according to David E. Watson of Spokane, treasurer. About 75 tons of ore were being stockpiled daily from development work, at last report. A 3-foot-wide, high-grade section of the vein reportedly averaged 16.5 percent lead, 10.3 percent zinc, 5.01 ounces of silver and 0.08 of an ounce of gold.

ARIZONA—The *Minerals Engineering Company* of Grand Junction, Colorado was the low bidder on 60,000 to 100,000 feet of exploratory drilling, from the surface, for the search for uranium-vanadium ore in the eastern Carrizo Mountains. The drilling will be done for the *United States Atomic Energy Commission* and is a continuation of drilling done on the Navajo Indian Reservation by the AEC. The average bid price for drilling was $2.25 cents per foot. Several types and depths of holes are to be drilled under the contract.

MANITOBA—*Hotstone Gold Mines* diamond drilling its *Bailey* group of claims in the Flin Flon area adjoining *Hudson Bay Mining and Smelting Company Limited's Thompson Lake* property. Geophysical surveys are also under way at Hotstone's property in the Kenora area adjoining property of *Noranda Mines Limited.*

BRITISH COLUMBIA—Eight claims a few miles north of the northeastern Washington state border have been purchased by *New Jersey Zinc Explorations, Ltd.* a wholly owned subsidiary of *New Jersey Zinc Company.* The claims were purchased from *Wesko Mines, Ltd.* to round out the *Oxide* and *Jackpot* groups which have been under development by New Jersey Zinc for several years.

QUEBEC—The *Aluminum Company of Canada* has shipped its first of 80 carloads of aluminum ingots to the United States. Totaling 8,800,000 pounds, the shipment is from the Shawinigan Falls plant. Other shipments will follow from the company's Arvide plant. Under a recent British-American agreement, provision is made for increased shipments to the United States at the rate of 4,400,000 pounds a month of Canadian aluminum for five months. These are over and above the firm's commercial deliveries to the U. S. which totaled nearly 200,000,000 pounds in 1951.

SASKATCHEWAN—*Western Potash Corporation, Ltd.* has maintained its operations near North Battleford ahead of schedule. The company's permit requires that $75,000 be spent in the first year,

and $80,000 in each of the following two years. During the fall of 1951, $200,000 was spent, while the expenditure for 1952 is about $300,000. In meeting these conditions, the company may apply for lease of not less than 640 acres and not more than 5,000 acres, and within six months of taking the lease must begin construction of a $1,000,000 potash producing plant.

ONTARIO—*American Zinc, Lead and Smelting Company* has taken an option on mining property in the area east of Port Arthur and has begun diamond drilling. Two of the optioned properties belong to *Andowan Mines*. Drilling is being done by *American Zinc Company of Tennessee*, a wholly owned subsidiary. The properties being tested are in the Dorion and McTavish Townships and are near transportation and hydro-electric power. Some work was done in the area many years ago, and owners of these old claims have been hard to trace. This has hindered subsequent development of the district by other companies and Andowan has helped a great deal in tracking down the owners. It is also reported that Andowan is negotiating with a Pittsburgh group on production at its titaniferous magnetite property at Mine Center, 50 miles west of Steep Rock. The company has ten claims with options on an additional 26. Andowan also hopes for a deal on its 29-claim iron property at Shabaqua, 48 miles west of Port Arthur. New financial agreements have been signed with American interests to provide funds for all of Andowan's increased activities.

MANITOBA—*Sourdough Bay Mines* plans to explore its 42 claims on Sourdough Bay in the Pas district. The holding is a copper-zinc-gold prospect on which 16,000 feet of diamond drilling was done by previous owners. The firm was incorporated last July. J. Drybrough is president, E. L. Brown, vice president, and R. G. MacKay is secretary.

BRITISH COLUMBIA—*Kootenay Belle Gold Mines, Ltd.* has reopened old workings at the *Richmond Eureka* mine above Sandon, British Columbia. On the No. 6 level, a four-foot-wide shoot of zinc-lead-silver-cadmium ore has been developed. During the past summer, the company treated dumps in an HMS plant and shipped the bulk concentrate to the Whitewater differential flotation mill at Retalick. Walter Maybank, Kootenay Belle's consulting engineer, is stationed at New Denver.

UNITED STATES—Wage increases for some 25,000 employees of 12 western copper companies were approved by the Wage Stabilization Board. In most cases, the board authorized straight wage boosts of 8 cents an hour, with another 7 cents to be used to adjust rates paid for particular jobs. In most cases, too, the raises are retroactive to July 1 when most old contracts expired. Mine companies involved are *Magma Copper Company, Combined Metals Reduction Company, Garfield Water Company, San Manuel Company, International Smelting and Refining Company, Copper Cities Transportation Company, Castle Dome Company, Miami Copper Company, Inspiration Consolidated Company, Kennecott Copper Company, American Smelting and Refining Company*, and *Phelps Dodge Corporation*. The employes affected work in Utah, New Mexico, Arizona, and Nevada.

WASHINGTON, D.C.—The United States Government has allocated 86,250 tons of sulphur to Canada for civilian and defense production during the first three months of this year. Canada is to receive a total of 345,000 tons during the year, which is an increase of 10,000 tons over the 1951 allotment. Canada, in turn, has promised that there will be no cutback in newsprint production, at least during the first quarter of 1952.

ALASKA—*Zenda Gold Mining Company* has made plans to convert tin operations to a dredge program, the first time a dredge has been used in this work in Alaska. Zenda will explore tin properties in the Seward Peninsula under a participation loan granted by the Defense Minerals Administration. An electric dredge now on Nome Creek in the Fairbanks area, will be dismantled and hauled overland 160 miles to Circle where it will be rebuilt on its pontoons and floated down the Yukon River and northward along the shore of Bering Sea to Tin City.

BRITISH COLUMBIA—The *Pioneer Gold Mines of B. C., Ltd.* and the *Alaska Dredging Company* have optioned the *McCready-Garland* properties east of White Water, British Columbia. An extensive exploration program is planned. The properties were last operated in 1949 for zinc.

SASKATCHEWAN—Under a proposed deal being negotiated by *Gateway Gold, Ltd.*, its uranium property in the Athabaska area together with some adjoining ground may be turned over to a new com-

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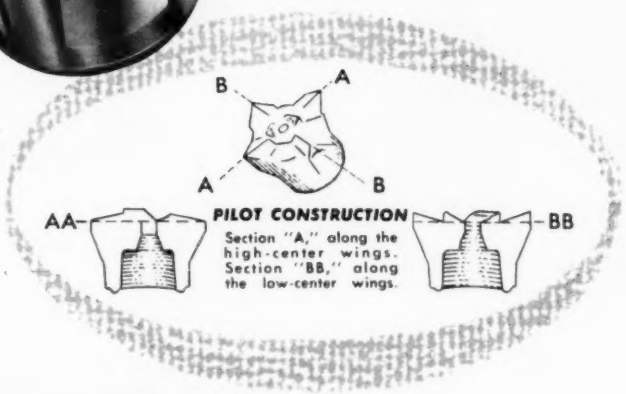

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pany for which Gateway would receive both cash and vendor shares. Only limited work has been done on the *Mor* group which is located between *Amax* and *Cinch Lake Uranium Mines*. The former is being developed by *St. Joseph Lead Company* and the latter by the *Mining Corporation of Canada Limited*. Gateway Gold has also granted an option to purchase its lead property in the Northwest Territories. The optionees will form a new company and will try to ship ore by sea next summer. Gateway will receive 10 percent interest in this venture.

QUEBEC—*Powell Rouyn Gold Mines* has begun sinking of its new shaft which will make the bottom level depth 3,050 feet against the present 2,450 feet. The company has also entered into a contract to mill ore from the former *Consolidated Duquesne Mining Company*, now part of the *Beattie Duquesne Mines*, on a custom basis. The contract calls for a minimum of 3,000 tons a month.

ONTARIO—Diamond drilling is going on at the property of *Kelore Mines* in the Michipicoten district. The area has been leased from *Lakemount Mines*, and Kelore proposes to spend $100,000 on the exploration of the base metal claims. Under terms of the agreement, Kelore has the right to acquire the property on a 99-year lease basis, while Lakemount will receive 10 percent of any net profits. M. N. Guthrie is the new president following the resignation of H. W. Knight, Sr.

ALASKA—The *Funter Bay* mine in southeastern Alaska will be explored for cobalt, nickel, and copper under a DMA loan of $120,000 to the *Admiralty Alaska Gold Mining Company*. The company is now renovating its camp and operating plant and plans to begin thorough exploration of the area in early spring. Ore production is expected to run at about 2,000 tons a day, if the exploration program proves up. A 10-ton stamp mill and ball mill are already on the property but production of cobalt would require construction of a reduction plant.

MANITOBA—The first three of five preliminary drill holes were completed on the Grant Lake showing at the Flin Flon area property of *Fairway Flinflon Mines*. Several heavily mineralized sections are reported to have been cut which will show some values in copper and zinc. If completion of the drilling brings favorable indications, a second drill will be used on the zinc showings. Three other zones are also to be tested. One is the Deanna showing about three miles south of the Zinc, and the others are anomalies indicated in the electromagnetic survey of the property.

QUEBEC—Reports of plans to erect a sulphur producing plant near Rouyn in northwestern Quebec are as yet unconfirmed. Rumors indicate that a recently incorporated firm, *Sulphur Converting Corporation*, will produce sulphur from sulphides using a German patent which was said to have been successful in Europe. The company, it is reported, would treat tailings from the old *Aldermac* mine, 10 miles west of Noranda.

BRITISH COLUMBIA—The *Cody Rico Company* is building a 125-ton-per-day mill for ores to be mined from the *Noble 5-American Boy-Slocan Sovereign* groups of claims in British Columbia. An aerial tram has been completed to the *Noble 5* mine.

ONTARIO—*Nanabijou Iron Mines, Ltd.* has been incorporated to develop a property on the Atikokan iron range about eight miles east of Steep Rock. Diamond drilling is under way and if the deposits prove valuable, the new company plans

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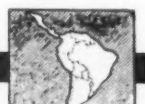
to install a sintering plant at the Lakehead where an option has already been secured. W. H. Pearce is president and Dr. M. W. Bartley is consulting geologist. The *North Range Mining Company* of Negaunee, Michigan, diamond drilled in the same area two years ago and reported finding a substantial tonnage of ore. However, operating plans have not yet been announced.

IDAHO—Stockholders of the *Coeur d'Alenes Lead Company*, Wallace, have voted to dissolve the corporation and to distribute its assets among the shareholders. Principal asset is 500,000 shares of *Atlas Mining Company* stock which will be divided on the basis of approximately one share for each four and one-half shares of Coeur d'Alenes Lead stock.

NORTHWEST TERRITORIES—*Rankin Inlet Nickel Mines, Limited* reports that drilling results obtained in 1951 justify additional drilling this year. The company has sufficient funds to take care of the major part, if not all, of the early season's work as recommended by the manager of the property. These recommendations involve diamond drilling about 4,000 additional feet.

QUEBEC—Exploration on the 300-foot level of the *Bordulac* mine in the Dasserat Township is proceeding. Some 215 feet of high-grade gold ore is reported to have been opened up in drifting on the 300-foot level. A Diesel compressor to furnish another 500 cubic feet of air is now being installed, prior to deepening of the shaft to 600 feet. Meanwhile, another 350 feet of drifting is to be carried out on the 300-foot level where the structure is opening up to the east, as revealed on the 150-foot level. The high-grade gold ore is expected to continue to occur in this drifting program. *Bordulac Mines Limited* operates the property.

BRITISH COLUMBIA—Surface diamond drilling at the copper property of *Rico Copper Mines Ltd.* has been termed as encouraigng. The company is now building a road to the site of the proposed 7,500-foot long crosscut adit which will be driven underneath the drill holes. A 3,000-foot high raise may be driven from the end of the crosscut. The property is in the Cheam Range 15 miles south of Laidlaw, British Columbia. *Chillicopper Corporation Ltd.* of Toronto has taken over control of Rico.



LATIN AMERICA

COLOMBIA—*Las Playas Mining and Development Corporation*, a subsidiary of *Callahan Zinc-Lead Company*, is continuing with a development program at the *Medina* zinc property which lies about 100 kilometers east of Bogota. About 70 men are employed and monthly production ranges from 50 to 100 tons of ore averaging around 60 percent zinc. The sphalerite occurs in almost pure form and the only method of cleaning or concentration is to run it through a small crusher and over a picking belt. The sorted product is sacked and transported to coastal ports where it is shipped to smelters in the United States.

VENEZUELA—Determination of the price that the Venezuelan government will pay *Guayana Mines Ltd.* for its property in that country is now before the courts. A board of three court appraisers have completed examination of the properties and equipment. The government expropriated the property in 1950 after the company had closed down operations because of large losses. The government claimed that it was necessary to reopen the mines because the economic activity of 10,000 people in the vicinity depended on the properties. The company, given a 30-day ultimatum, said it could not reopen under the conditions existing in the country. Debts amounted to $650,000. *Frobisher Limited* and associated companies who control Guayana advanced half a million dollars to pay off the most pressing debts. Immediately following this, the government expropriated the properties. A settlement price of 5,500,000 bolivars ($1,650,000) reportedly offered by the Venezuelan government was considered too low by the company. Work done over a three-year period indicated substantial tonnages of half-ounce gold ore.

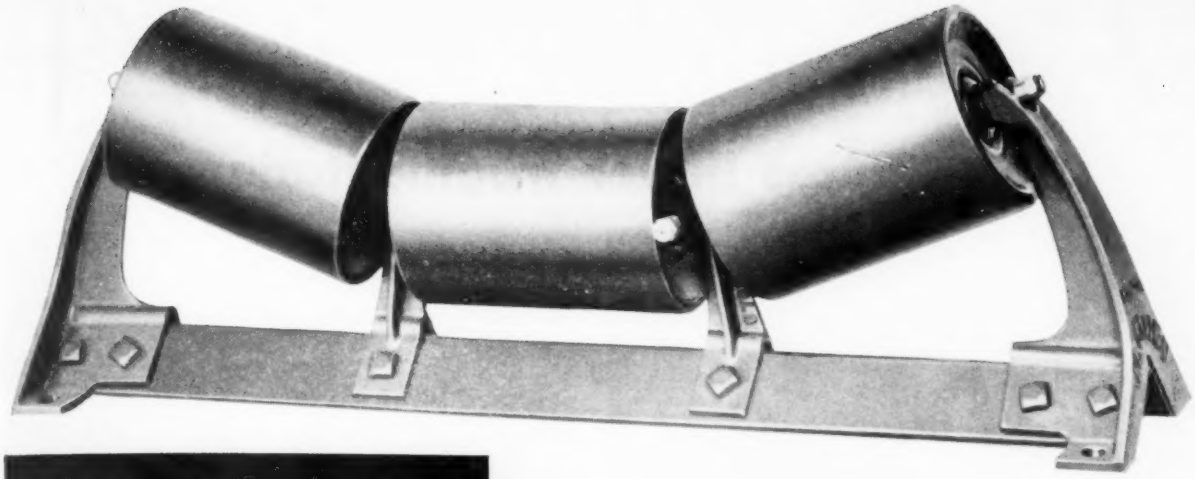
BRAZIL—The state government of Sao Paulo plans to build a steel mill which would rival *Volta Redonda*, the largest in South America. According to reports, Sao Paulo Governor Lucas Nogueira Garcez has preliminary plans ready for the mill but a site has not yet been chosen. Initial cost of the mill would be about five billion cruzeiros or some $90,000,000. There is a reported possibility that the new mill would use iron ore recently discovered in the coastal range southwest of Sao Paulo, or from the old ore beds at Ipanema.

MEXICO—The reported discovery of uranium at Zimapan, Hidalgo, is being checked by the Ministry of National Economy. A federal law requires that all known uranium deposits and all discovered must be placed under government control and guarded by government troops.

CHILE—The finance minister has asked for congressional approval on a new taxation agreement with foreign copper companies. The companies are reported to have agreed on a 50 percent fixed tax and a 17.3 percent surtax which will decrease as production increases. The government, in turn, agrees to levy no new taxes for 15 years, except in case of war. Chilean copper production is said to be increasing at a rate which will triple output in a few years. All major American copper companies operating in Chile have signed the agreement, including *Anaconda*, *Andes*, *Chile Exploration*, and *Braden*.

COLOMBIA—*Chivor Emerald Mines Inc.*, operators of the famous *Chivor Emerald* mine in the Department of Boyaca, are now in a stage of bankruptcy, and all operations have been suspended for some time. It is reliably reported that the debts of the company amount to more than a half million pesos, or around $200,000. The laborers have not been paid for months. The present status of the company comes as quite a shock to the emerald industry because in 1949 the mine produced 60,000 carats of emeralds. At that time and in the following year the prospects were reported to have been very promising.

Continued on Page 65



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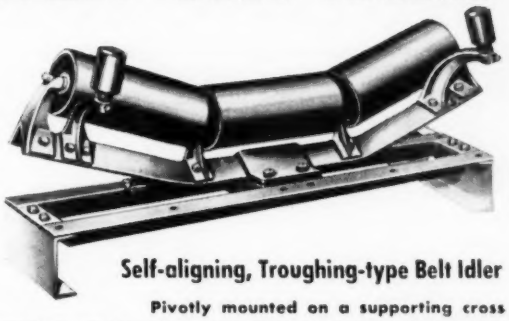

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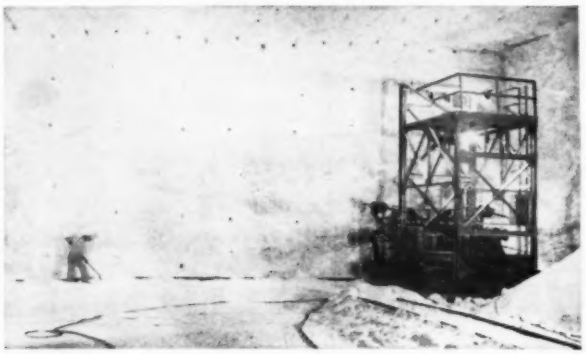

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Loading face with Du Pont Extra Dynamite. Rooms average 25' high by 75' wide. Average round consists of 108 holes drilled to same depth as the undercut, about 11 feet. All loading in this mine is done from the drill jumbo shown in picture at the left. Parallel series hook-up is used in firing the blast.

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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Continued from Page 62

BRAZIL—Belgian steel makers are offering to purchase 25,000 tons of high-grade iron ore from Brazil at better than world market prices. The proposed deal was stimulated by large-scale Brazilian purchases of Belgian steel goods in 1951, totaling more than 230,000 francs per quarter. Belgium has also offered to provide Brazil with some of her coke needs.

MEXICO—The *American Smelting and Refining Company* is constructing a 400-ton-per-day differential flotation mill near Sinaloa, Mexico, for the *Nuestro Sonora Culican, S.A.* Fine grinding will be done in a 78 Marcy ball mill in closed circuit with a 68-inch Wemco classifier. Fagregreen cells will be used in the flotation circuit.

NICARAGUA—*La Luz Mines*, operators of a gold mining concession about 90 miles west of Puerto Cabezas, declared two dividends to shareholders during 1951. Similar payments were made in April and November of 1950.

MEXICO—A steel foundry is to be established at Monterrey, Nuevo Leon, by *Cia. Aceros de Monterrey, S.A.*, organized by Agustin Rodriguez, a banker, and Enrique Ayala Medina, an industrialist. Capitalized for 12,000,000 pesos (1,380,000), Aceros is buying machinery and equipment for the plant which is expected to start operations later this year.

BOLIVIA—Additional equipment has been installed at the *Fabulosa* mines, controlled by *Bolivian and General Tin Trust, Ltd.* An attempt is being made to develop a certain amount of ore reserve, so that the company will know more or less what ore can be put through the mill.

BRAZIL—Workers from the quartz mines of Niquelandia, in the state of Goiás, discovered a gold deposit at Jacuí, about 22 miles from Uruacu. Nuggets of 100 and 200 grams of gold are said to have been found frequently.

COLOMBIA—Work is progressing satisfactorily at the property of *Frontino Gold Mines Ltd.*, located at Segovia, Antioquia. Milling rate is around 350 tons of ore per day, averaging 12 dwts. of gold per ton. The ore also carries a small amount of lead and scheelite and work is now being carried on to make an economical recovery of these. A small smelting plant is being erected to see if the galena concentrates can be economically treated at the property.

CHILE—Copper is reportedly being sold to Pakistan. The first shipment of 3,000 tons is said to be scheduled for shipment via a United States or European port because there is no direct shipping line between Chile and Pakistan.

COLOMBIA—*Compania Minera De Limon* is working a crew of 50 men and carring on a development program at its mine near Zaragosa, Antiquia. Work to date has opened up an ore body a little over 1,000 feet in length and averaging 15 inches in width, carrying 35 grams of gold per ton. Ore from the development work is helping to defray a considerable part of the costs. It is being treated in a small amalgamation and cyanide plant on the property. George Leland and Hubert van Stauffen, mining engineers of Medellin, own a major interest in the mine.

MEXICO—Organized and registered in Mexico, D.F., are the following new companies: *Minera Maria de la Paz, S.A.*, by Gaston J. Petit and Jose A. Garcia; *Impulsora Minera de Mexico, S.A.*, by Federico Femer and Manuel Jaidro; and *Cia. Minera Santa Anita, S.A.*, by Ventura Garcia and Armando Hernandez.

BOLIVIA—*Patino Mines and Enterprises Consolidated, Inc.*, for the nine months ended September 30, 1951 estimated its income at 145,000,000 bolivianos (approximately $2,400,000) with a loss of $270,000 before providing for taxes. After taxes, this estimated net income amounted to 114,000,000 bolivianos (about $1,900,000), with a loss of $370,000. For the same period in 1950, net income after taxes amounted to 79,930,000 bolivianos (about $1,330,000) plus $2,190,000. Tin in concentrates shipped but not sold at September 30, 1951, was valued at $1.12 per pound of fine tin, fob South American port, as against $1.16¼ per pound of fine tin on September 30, 1950.

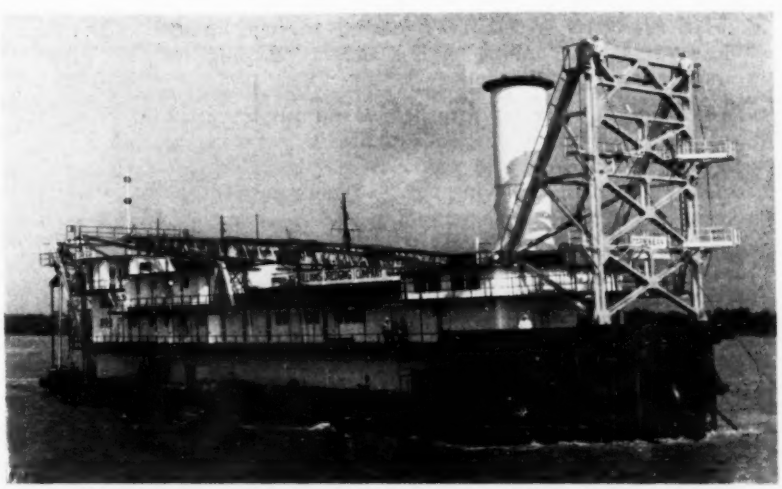
MALAYA—A Japanese company, *Malay Industrial Development (Sangyo Kaihatsu) Company* is reportedly planning to develop iron ore and bauxite mines in the Malayan Peninsula. A study of the area has been made by company representatives and work is scheduled to start soon. The iron ore desposits are in Kelantan and the bauxite deposits in Johore.

INDIA—During 1950-1951, the flotation mills of the *Metal Corporation of India* produced about 1,000 tons of zinc concentrates, containing 50 percent zinc. As there is no facility for smelting, the whole lot was exported to Rotterdam. Fifty-five percent of the recoverable zinc was returned to India as metal.

CHINA—Comparing the same period in 1950 with the first half of 1951, the sale of coal from all national coal mines increased 22.4 percent, while the production from January until August increased 26.29 percent. Practically no new mines have been opened but the number of faces mined with mechanical equipment has been doubled. In China proper, about one-quarter of the working faces have been mechanized. Modification of working methods for thick seams (over 10 meters thick) has increased production from 80 to 95 percent. Coal production per man-shift is said to have increased 23.64 percent, injuries have decreased 65.5 percent, and fatalities have decreased 75.2 percent. (The base year 1950 was figured at 100 percent.) Neither gas nor dust explosions are said to have occurred during 1951.

MALAYA—The *Penawat No. 1* connected bucket line dredge of *Southern Kinta Consolidated Ltd.* with 9-cubic-foot buckets completed trials and started production on November 1, 1951.

INDIA—Extensive deposits of ilmenite sands found in the Ratnagiri district of Bombay state are expected to give India a leading position in titanium. Indian experts believe that ilmenite production can be raised from its present level of about 200,000 tons a year to around 500,000 tons, as a result of this find, if the demand warrants it.



DREDGE RIVER CHANNELS FOR ORINOCO

Two of the largest American cutterhead hydraulic dredges are engaged in the dredging of a ship channel for Orinoco Mining Company in Venezuela. Gahagan Overseas Construction Company and the McWilliams Overseas Dredging Corporation are doing the work. Each dredge has a capacity for moving about 700,000 cubic meters of material a month. Pictured above is the "Caribbean," owned by McWilliams. At a cost of more than $15,000,000, a 26-foot channel will be dredged through the Macareo and Orinoco rivers for a distance of 170 miles. This will enable ocean-going carriers to proceed directly to the Atlantic Ocean from ore-loading docks to be constructed at the river terminal of Puerto Ordaz. A 90-mile railroad will be built to connect the port with the Cerro Bolivar property.

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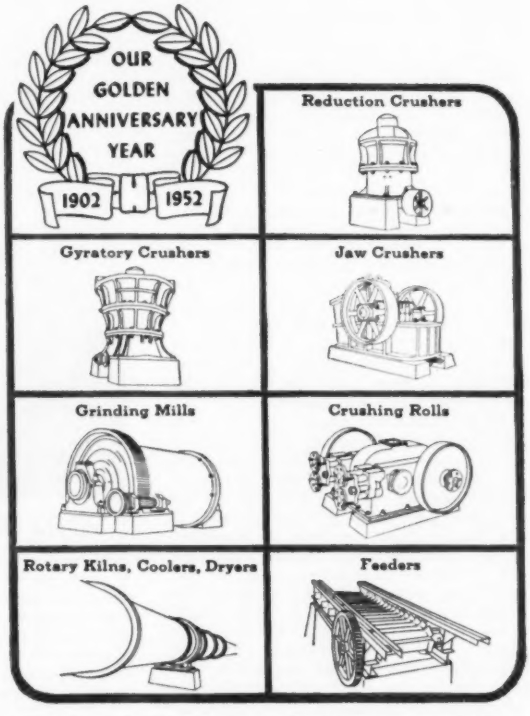

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Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.

A TRAYLOR LEADS TO GREATER PROFITS

TURKEY—Prospectors of the *Turkish Mineral Research Administration* are reported to have discovered large deposits of wolframite ore at Uludag in Bursa. Construction of a complete processing plant is scheduled for the future. Meanwhile, export of the semiprocessed ore is expected to add to Turkey's foreign exchange appreciably.

INDIA—*Mineral Recovery Ltd.* of London, England has designed a special HMS plant for treating manganese ore from the mines of the *Central Provinces Manganese Ore Co. Ltd.* The separatory vessel for the plant will be an 8 by 6 foot Wemco drum. The plant is scheduled for initial operation in 1952.

CHINA—Compared with 1949, the production of iron and steel in 1950 increased 294 percent and that of colored metals 190 percent.

INDIA—It is reported that a survey of bauxite deposits in the Manipat Plateau of Surguja district of the Central Province has revealed a reserve of nearly 8,000,000 tons found in an area of 100 square miles. Large deposits of magnesite have been found in the Himalayan Ranges adjoining the state of Uttar Pradesh. Reserves of sodium carbonate, sodium sulphate, and saltpeter in Uttar Pradesh are estimated at 540,000 tons, 300,000 tons, and 10,000 tons respectively. Kurnool district in the Madras state which claims rich deposits of lead is now under survey. A thick seam of coal, estimated at about 50 feet thick, has been discovered in Vindhya Pradesh.

WESTERN AUSTRALIA—Gold production for this state for the first nine months of 1951 was 465,540 ounces, an increase of about 4 percent over the corresponding period in 1950. Interest in the Dundas goldfield near Norseman has been revived with the taking up of two leases for copper. Forty miles northwest of Kalgoorlie in the Ora Banda district wolframite deposits are being investigated. *Western Queen (1936) N.L.* has decided to double its capital by the issue of new shares to the value of £A60,000. The money is to be used to obtain and to equip mineral claims at Greenbushes. Also in the Greenbushes field, *Amalgamated Tin Ltd.* is increasing capital with the object of extending plant capacity. *North Kalgurli (1912) Ltd.* paid a dividend of 100 percent for the year ended January 2; 244,066 long tons were treated for a recovery of 59,063 ounces. The previous year, the company paid 112½ percent. *Lake View and Star Ltd.* treated 625,900 long tons for the year ended June 30th. The dividend remains steady at 2/6 per share.

TASMANIA—It is reported that *Renison Associated Tin Mines N.L.* may sell its mine for £A250,000 cash. Shareholders will be asked to approve the sale which has been negotiated with Dr. C. Loftus Hills. Directors also seek a 1 percent royalty or one-eighth of the shares in a company with £A1,000,000 paid capital. Rension Associated has declared £A22,292 in dividends. The mine yielded tin worth £A14,465 in the four months to October 1951.

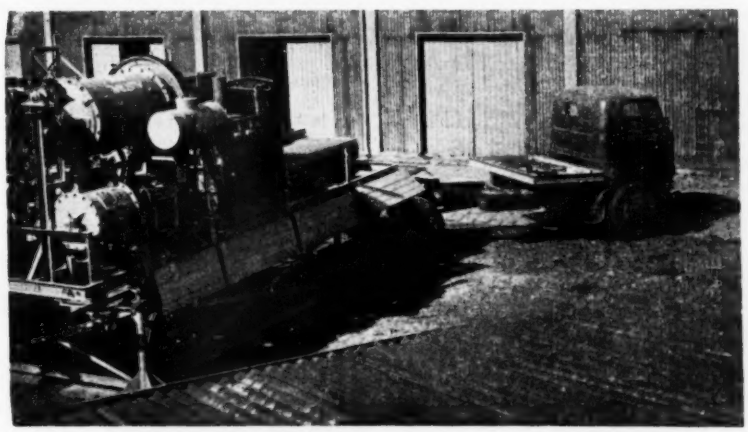
PHILIPPINE ISLANDS—*San Mauricio Mining Company* is expected to go into production this month, following a year of rehabilitation work. A loan of $500,000 by the Philippine Rehabilitation and Finance Corporation enabled the company to start dewatering operations last February. This was completed to the 750-foot level by the end of September. A supplementary loan of $500,000 has been requested to complete rehabilitation, to increase capacity of the mill, and to purchase additional mining equipment. *Marsman & Company, Inc.* manages the mine.

NEW CALEDONIA—Greatly increased nickel output during 1952 is expected to relieve France's acute shortage of the material. About 6,500 tons is expected to be produced in 1952. A Government mission investigated the area and listed four factors which would govern increased production: the addition of modern mining equipment; adequate coal supplies; sufficient rains to insure hydroelectric power; sufficiently attractive prices. *Le Nickel* has received a $965,000 credit to purchase equipment. Additional coal supplies will come from the United States to make up for decreasing shipment from Australia. Le Nickel is expected to produce more nickel in 1952 than the estimated production of 13,000,000 to 14,000,000 pounds for 1951. The mines and plants are currently being modernized and further developed.

NORTHERN TERRITORY—Mineral production for the year ended June 30, 1951, reached a record total of almost £A900,000. Value of gold production was £A625,000, while wolframite production rose to ten times the previous year's valve of £A12,000 (now £A120,000).

NEW GUINEA—During the first five months of the current fiscal year, *Bulolo Gold Dredging, Ltd.* reports that it handled 4,497,520 cubic yards for a total recovery of 31,350 ounces of fine gold. This amounted to $1,097,250 or 24.39¢ (U.S.) per cubic yard. Dredges No. 3 and 6 have been permanently closed down since May 1951. Dredges No. 2, 4, 7, and 8 have been in operation, while No. 5 has remained in course of rehabilitation. About the middle of 1953, dredges No. 4 and 8 are expected to close down and No. 2 about the middle of 1954, leaving only No. 5 and 7 in operation. Estimated reserve for No. 5 is about 29,000,000 yards and 31,000,000 yards for No. 7.

UNITED KINGDOM—In Cornwall, both the *Geevor* and the *South Crofty* mines continue with production although a serious breakdown of one of the pumping installations last year caused a setback for some months at the South Crofty. At Geevor, tin production has fallen slightly since last June but remains at about 60 tons of concentrates per month. Figures for the year ending March 1951 showed an operating profit of £246,906, compared with £68,375 in 1950. The company experienced an exceptional year because of the unusually high average price of tin coinciding with satisfactory mine development. Footage increased over the previous year, while ore reserves blocked out are estimated at three years. Arrangements have been made with the Crown (owners of all mineral rights under the sea in and around the United Kingdom) under which



AUSTRALIA USES PORTABLE MILL

The portable milling plant pictured above has been specially built for the Department of Mines in Victoria, Australia. For convenience in transportation the plant is built on a semi-trailer eight feet wide and 20 feet long. Considerable thought had to be given to the selection of the trailer and seven ton truck because the plant must be transported hundreds of miles between the various gold mining districts in Victoria. The plant is equipped with a roll jaw crusher, ball mill, rotary spiral screen, amalgamation plates, tables, and a small amalgamation barrel. It is equipped with a 400-gallon water tank and a centrifugal pump. Power is furnished by a 30 hp. Diesel engine.

levels can be driven further west into the Levant undersea Section which was a very productive part of the famous *Levant* mine. Present plans do not call for unwatering the old mine at present but if one of the lodes maintains its present strike it will enter the Levant area well to the north of the main workings. An order has been placed for a new mine headframe for Geevor and bids are being considered for an electric hoist. At South Crofty, an operating profit of £42,925 was reported with 37,716 tons of ore milled, yielding 479 tons of tin concentrate. It has also been announced that *Bartles Engineering Works* owned by this mine has been sold to *Holman Brothers Ltd.* At the *Castle-an-Dinas* wolframite mine, a subsidiary of South Crofty, things are satisfactory because of the high price of wolframite, further exploration by diamond drilling is under way. At the *New Consols* mine, water has been pumped out of the old mine to the bottom levels and development is proceeding on the lode. Some tin is being recovered from the upper levels and dressed at the mine.

SPAIN—The *Riotinto Company* has not replied to rumors that it, together with the *Tharsis Sulphur and Copper Company*, will acquire 20 to 25 percent of the capital of the Duisburg copper refinery owned by *Duisburger Kupferhutten*. At the present time, an agreement has not yet been reached.

HUNGARY—The *Stalin* plant at Stalinvaros, Hungary's largest iron works, has begun operations. The plant was originally called *Dunapentele* but it is reported that the name was changed at the request of the town's 60,000 inhabitants.

ITALY—Mining output during the first nine months of 1951 showed an increase of 15 percent over the same period in 1950, according to figures from the *Instituto Centrale di Statistica* in Rome. There was an increase of 7.6 percent in the output of metallic minerals and 17.8 percent in the output of non-metallic minerals. Manganese output increased from 11,823 tons to 19,511 tons; zinc ore from 133,800 tons to 154,800 tons; quicksilver ore from 105,944 to 124,382; iron ore from 345,000 to 374,000; and bauxite from 113,000 to 117,000. In the non-metallic field, asbestos ore output increased 9 percent and sulphur 27 percent, particularly in Sicily.

DENMARK—Lead deposits at Greenland are to be exploited by a Danish company, formed with Danish and foreign capital. Tests on ore deposits at Mestersvig in East Greenland are said to show at least 400,000 tons of ore. The share capital is reported to be 10,000,000 kroner to start. If investigation proves the deposit to be as rich as anticipated, the capital will probably be increased to 100,000,000 kroner. The Danish Government will contribute to the share capital.

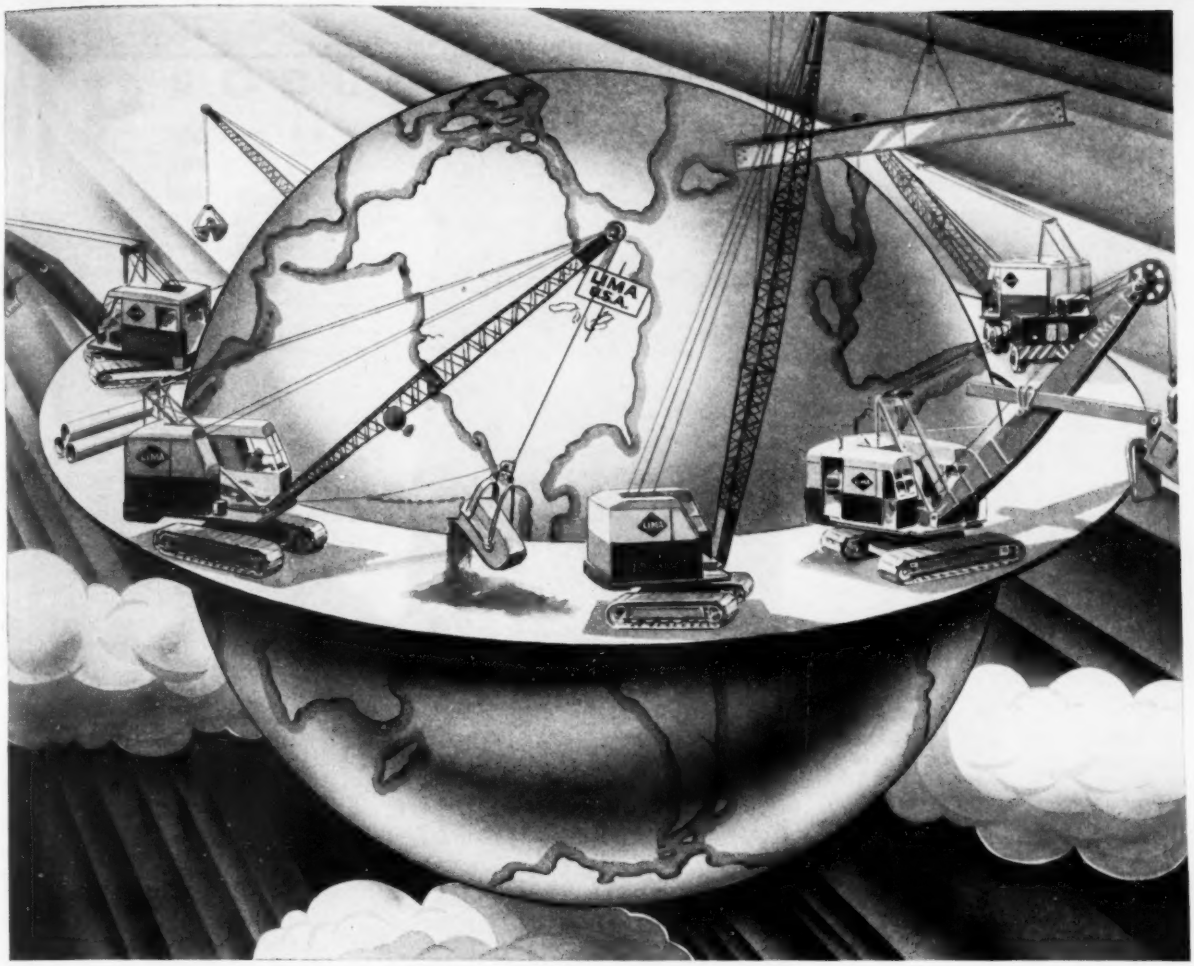
YUGOSLAVIA—New shafts are reportedly being sunk at an old Roman silver mine at Bratinac near Srebrnica. Six or seven veins are said to exist which can be mined cheaply. Another mine is also being reopened near the River Drina in Serbia, and future development will depend on the relative value of ores in the two mines.

RUSSIA—In a recent speech, Mr. Beria Minister of Home Affairs, said that in the past year pig iron output had increased by nearly 3,000,000 tons, raw steel by 4,000,000 tons, and rolled steel by 3,000,000. He also asserted that the Soviet Union is now producing as much steel as Britain, France, Belgium and Sweden put together. In 1950, the four countries mentioned produced nearly 30,000,000 long tons.

GERMANY—Delivery has begun on 245,000 tons of iron ore from Luxembourg to Ruhr iron works. The contract was made the rate of 145 francs a ton, free frontier. In Luxembourg, the business is being handled by interests independent of the domestic steel concerns.

ITALY—Construction of an electrolytic zinc plant at Nossa in the province of Bergamo will increase Italian output of zinc, cadmium, and sulphuric acid. The *Societa per Azioni Piombo e Zinco* (*SAPEZ*) has signed a contract with the *United States Economic Cooperation Administration* (now the *Mutual Security Agency*) involving a total of 934,000,000 lire for the construction of the new facilities. Equipment and machinery will be purchased in foreign countries. Work will be provided for an additional 350 workers while 700 more will find work in the Sardinian zinc mines and connected services.

CYPRUS—Active underground development of the Kinousa area by *Cyprus Sulphur and Copper Company Ltd.* is progressing. First ore is being shipped from the area, and its zinc content is said to "foreshadow a new industry in Cyprus." *Esperanza Copper and Sulphur Company, Ltd.* owns the controlling interest in the Cyprus company.



SERVING DEPENDABLY AROUND THE WORLD

In these far corners of the earth, there are no repair shops "just around the corner"—and any breakdown means costly lost time and many complications. The *extra* durability that is built into Lima equipment gives it an *extra* advantage in these remote assignments.

The extra durability comes from such features as oversize drums that reduce cable wear . . anti-friction bearings (pioneered by Lima) that cut friction losses, reduce wear, and promote smooth operation . . . live-weight counterbalancing that saves wasted power . . . and air controls that cushion and soften stresses and shocks. Throughout, there is simplicity of design, and superlative engineering, that means your Lima will stay on the job under the most punishing conditions.

There are LIMA agents located throughout the world prepared to assist you in selecting the proper equipment for your job, and to render prompt and efficient service whenever needed. Contact the Lima, Ohio office for the name and address of the LIMA agent nearest you.

LIMA SHOVELS are available in capacities from ¾ to 6 yards.

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LIMA DRAGLINES are available in variable capacities to suit specific needs.

Wheel or truck mounting is available on machines of ¾ and 1 ½ yards capacity.

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STOPER

that lengthens the life of TUNGSTEN-CARBIDE BITS

Combining just the right piston speed, foot-pound blow, rotating speed and feed-leg pressure — plus excellent balance — the CP-34 STOPER assures long service from tungsten-carbide bits.

A special feature of the CP-34 is a ratchet-type twist throttle on the holding handle, for graduated control of feed-leg pressure. In addition, a button on the handle provides instant pressure release should the bit stick.

Write for complete information.

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PRODUCTION EQUIPMENT PREVIEW

PEP is just what new equipment, increased mechanization, and new methods can give to your mine, mill, or smelter. This PEP section is MINING WORLD'S way of making available to you some of the finest current information on mechanization.

FREE-LITERATURE PREVIEW

To get any item of free literature illustrated or described in the Production Equipment Preview, note the key number of that item, circle the corresponding number on the PEP coupon, and mail it to Mining World, 121 Second St., San Francisco 5, Calif.

NEW SURFACE COATING: The Steelcote Manufacturing Company has developed a new surface coating that does many tough maintenance jobs not now satisfactorily performed by pigmented paints and enamels. The new product is a stainless steel coating that can be applied to all metal surfaces with brush or spray gun at a cost of approximately 4¢ per square foot. The resulting surfacing gives the appearance of unpolished stainless steel and protects the coated material against rust, corrosion and other types of deterioration. For additional information circle no. 1.

NEW DENVER JAW CRUSHER: The Denver Equipment Company is now producing a new 10 by 20-inch jaw crusher in order that their line of Type "H" Forced Feed jaw crushers might be more complete. The new crusher is mounted on an electrically cast steel, one-piece frame and has reversible jaws and cheek plates of 13-14 percent manganese steel. For further information circle No. 3.

SEALER FOR GRINDING MILLS: Having trouble with dripping pulp or slurry from improperly sealed bolts in wet-grinding ball, rod, or pebble mills? Allis-Chalmers has announced a new molded rubber liner-bolt sealer that eliminates splitting due to diametric expansion, does away with a special retaining ring, provides greater ease and simplicity in assembly, and absorbs much of the prestressing load caused by over tightening. For additional data circle no. 4.

LOADERS: For full information on how the new developments in rocker shovels can save you money in loading and materials handling, write Eimco Corporation, 634 So. 4th West, Box 300, Salt Lake City, 10, Utah, or circle PEP No. 8.

TRACTOR ATTACHMENTS: Baker Manufacturing Company has announced release of a bulletin describing in detail their bulldozers, gradebuilders and root rippers to work with Allis-Chalmers tractors. To receive this bulletin, circle PEP No. 10.

SPUR-GEAR HOIST: The Challenger, a new Coffing spur-gear hoist, is available in ½ and 1 ton capacities. It features lightness, strength, and ease of servicing. Circle No. 14.

RUST INHIBITOR: For protection of boilers, flues, and pipes subject to rust and corrosion, ask for information on the new grades of Corrosanti by circling PEP No. 15.

PUMPING PROBLEMS: If you pump slimes, slurry, sands, or other solid-liquid mixtures, information on the complete line of pumps produced by Morris Machine Works will be useful in solving your pump problems. Circle No. 16.

PUMPING UNITS: Economical pumping units for every industry are cataloged in a new "Handy Guide to Selection of Centrifugal Pumps" released by Allis-Chalmers. For Bulletin 52B6059G, circle No. 17.

DIESEL TRACTOR: Specifications and a large cutaway view, keyed to the features of the machine, of Caterpillar Tractor Company's Diesel DW10 tractor can be obtained by circling No. 18.

ROPEOLOGY: For those who are interested in keeping their wire rope costs to a minimum, MacWhyte Company has published a new bulletin, "Wire Rope—So What?" To obtain a copy, circle PEP No. 21.

MINE HOISTS: Nordberg has published a new 24-page bulletin illustrating their complete line of mine-hoists and describing, with pertinent engineering data, the installation of these units. Circle No. 22.

BITS: How to successfully recondition tungsten-carbide bits is shown in a 20-page book released by Rock Bit Sales & Service Company. Many helpful operating suggestions are given for obtaining the maximum speed and footage out of carbide bits. This information is yours if you circle 23.

IMPROVED MERCURY FURNACE: The improved Gould rotary quicksilver furnace is designed to meet all operating requirements and provide high recoveries at low operating costs. For further information circle No. 24.

AERIAL SURVEYS: Abrams Aerial Survey Corporation has published a new booklet on the production and use of aerial photographs, topographic maps, and mosaics. To obtain this guide to aerial surveying, circle No. 27.

VIBRATING SCREENS: The Link-Belt Company has recently published a 20-page book on their complete line of vibrating screens with complete engineering data included. Circle no. 28.

MILL DESIGN: The Galigher Company recently announced the publication of a comprehensive new catalog on improved flotation practice and mill design. For a copy of this valuable literature, circle No. 37.

SAMPLING MILL CIRCUITS: A new brochure is available that covers improved sampling methods with the Geary Jennings Sampler. A copy of the brochure can be had by circling No. 38.

MEASURES BIN CONTENTS: Bin-Dicator keeps an eye on the level of material in silos, hopper bins, or chutes, and automatically reports to a central control point. It prevents overfilling or underfeeding conveyors, etc. A 20-page booklet describes this product as well as Bin-Slow, a device which keeps dry, finely ground materials moving in bins, chutes, etc. Circle PEP no. 42.

ICE OR SNOW BOUND? The thawing capacity of one pound of Ice-Rem, produced by Speco, Inc., is approximately 30 times that of salt. If used prior to a snow or sleet storm, it will melt subsequent snows until its exothermic action, ten times faster than that of standard flake calcium chloride, is exhausted. For further information circle no. 44.

LUBRI-CUT: A new fire-resistant cooling and lubricating agent that triples production output, at the same time increasing the life of taps, drills and cutting tools up to 12 times, has been announced by the Tap and Drill E-Z Corporation. For further information, circle no. 60.

PEP Editor February '52

MINING WORLD-WORLD MINING

121 Second St., San Francisco 5, Calif.

Please send me complete and free information on the following equipment described in your PEP section, and keyed by the numbers I have circled:

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CIRCLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NUMBERS	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
YOU	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
DESIRE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Also send further free information on the equipment advertised on page:

_____; Product_____; Manufacturer_____

_____; Product_____; Manufacturer_____

Name_____**Title**_____

Company_____

Address_____

City_____**Zone**_____**State**_____

Whiting Trackmobile Saves Time and Manpower

The Trackmobile, manufactured by the Whiting Corporation of Harvey, Illinois, is equipped with two sets of wheels; one retractable set of rubber-tired wheels for ground travel, and another set of standard AAR wheels for track travel. All controls are within easy

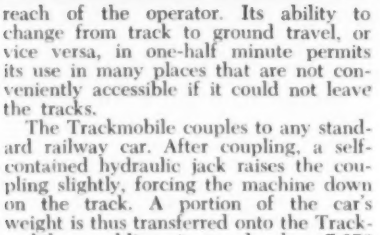
reach of the operator. Its ability to change from track to ground travel, or vice versa, in one-half minute permits its use in many places that are not conveniently accessible if it could not leave the tracks.

The Trackmobile couples to any standard railway car. After coupling, a self-contained hydraulic jack raises the coupling slightly, forcing the machine down on the track. A portion of the car's weight is thus transferred onto the Trackmobile, enabling it to develop 7,350 pounds of drawbar pull.

Those who have car handling problems can obtain additional information by circling no. 81.

Puncturing Tool For Cold Weather Starting Aid

The California Oil Company has announced a new puncturing tool to be used with the priming system for Chevron starting fluid capsules, a cold



weather starting aid for both Diesel and gasoline powered equipment.

Upper and lower chambers of the tool are protected by overlapping metal skirts. The device, an aluminum die casting that cannot crack or break features at the end of the lower chamber a removable, easily-cleaned plug and screen trap that is chain-attached to prevent loss. Circle no. 90.

Training For Diesel Operators And Owners

On-the-job training in the operation and maintenance of Diesel engines offered by General Motors has now been made available to Diesel owners and operators in practially all parts of the North American continent. The newest addition to the mobile training schools has been dispatched to its first assignment near Alberta, Canada. Another unit installed in Mexico is training Diesel men south of the border.

Owners and mechanics in the United States have been quick to realize the advantages of this practical training and over 10,000 men have already attended the schools. Similar training is available to truckers.

The training course is open to Diesel engine owners and operators upon application to Detroit Diesel's distributors and GMC truck dealers. For further information, circle no. 98.

New Data Available on Link-Belt Spray Nozzles

Up-to-date information on non-clogging spray nozzles for cleaning all kinds of materials, screens, and the like, is given in a new folder no. 2386 released by the Link-Belt Company.

These nozzles consist simply of a scientifically shaped, curved bronze deflector having a smoothly-polished water contact surface and a sharp, true discharge edge—with a U-bolt and two hexagon nuts for holding the deflector

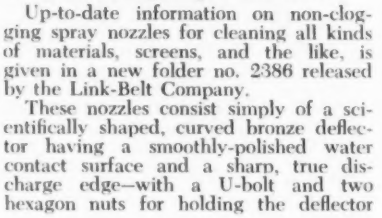


Fig. 3362 U BOLT-D

DIMENSIONS IN INCHES

Pipe diameter, inches*	Weight each, pounds	A	B	C	D	E	F	G
1	.7	3⅛	2⅞	1⅜	¼	2⅜	⅝	⅞
1¼	.8	3½	3	2	¼	¾	⅝	⅞
1½	1.2	4⅛	3½	2½	⅛	1¼	1⅛	⅝
2	1.3	4⅛	3¾	2⅝	⅛	1⅜	1⅛	⅝
2½	1.5	4¼	4	3⅜	⅜	1¼	1⅛	⅝
3	1.8	4⅜	4⅞	4	⅜	1⅝	1⅜	⅝

*All sizes normally carried in stock.

in proper position on a pipe drilled with a plain hole at each desired spray location.

The folder shows by text and illustration how simply and quickly the nozzles can be installed. Complete engineering data are included. Circle no. 85.

Electronic Device Controls Mill Feed by Sound

An electronic device to maintain close tolerances of particle size in ball mill product has been announced by the Hardinge Company. The apparatus was designed to maintain constant, the amount of material actually being ground in the mill at any given time, rather than the feed rate.

The "Electric Ear" microphone is located at a point just below the horizontal axis of the ball mill. As the amount of material being ground in the mill is reduced, via the ball mill discharge, the noise level of the mill rises. This activates the mechanism which starts the feeder to bring more material into the mill. As the amount of material in the mill builds up, the noise level is reduced and the equipment automatically stops the feeder. Circle PEP no. 7 for further information.

High-Strength Plastic Tape for Pipe Protection

A new heavy-duty plastic electrical tape designed for applications where high mechanical strength is needed ha

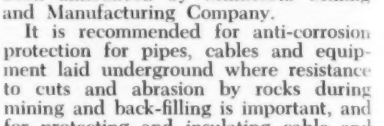
been announced by Minnesota Mining and Manufacturing Company.

It is recommended for anti-corrosion protection for pipes, cables and equipment laid underground where resistance to cuts and abrasion by rocks during mining and back-filling is important, and for protecting and insulating cable and high tension leads subject to wear, abrasion and rough handling. For further information, circle no. 86.

Self-Dumping Unit Boasts Exceptional Versatility

A new addition to the Phillips Mine and Mill Supply Company's line of material handling equipment is the Model T-SRF-½ Phil-Dump trailer car. This self-dumping unit was designed for three-way use—handling by one man, lifting and transporting by fork lift truck, and towing singly or in train by industrial tractor. The unit features a sturdy tongue for manual and tractor handling with pockets for accommodating the prongs of a lift truck.

Made of heavy gauge steel with all-welded construction, the car has wheels, two of which are castered, equipped



with roller bearings and solid rubber tires.

Balance of the hopper is such that when the safety catch is released the load is emptied, after which the hopper automatically returns to the loading position, re-engaging the safety catch. Additional details may be obtained from the company at 2397 Jane Street, Pittsburg 3, Pennsylvania, or by circling no. 100.

Silver Bell Shipping Base Metal Ore from Carbonero

The Silver Bell Mines Company has made plans to continue development work at its Carbonero mine above Ophir, San Miguel county, Colorado, during the winter. The company is employing Emory Ray and his D-7 bulldozer to keep the road to the mine from Ophir free of snow so that trucks can haul ore down and men and supplies up to the mine. A. A. Smith is in charge of the Carbonero and the company's Silver Bell mine, as well as the 180-ton-per-day flotation mill at Ophir Loop.

The Carbonero mine is now producing from one stope, and one drift is being driven east on the Carbonero vein on the 8th or haulage level with excellent showing of silver, lead, zinc, and copper ores. More headings will be started upon completion of the assembly of an additional compressor.

The Silver Bell mine is producing a good rate of tungsten ore that will soon be concentrated in the company's new tungsten plant, built adjoining the main mill building.

Silver King Undertakes Three DMEA Projects

The Silver King Coalition Mines Company has started work on three exploration projects at its Park City, Utah holdings under terms of a fifty-fifty, cost-sharing agreement with DMEA, according to James Ivers, vice president and general manager of Silver King. Total cost of the three projects is estimated at $321,000. The projects and their costs are:

Project No. 1: Cost, $93,728. An adit is now under way into the hill on about the level of the collar of the Thaynes shaft. The Comstock vein will be cut and drifted on for 2,100 feet. At three-places, it is proposed to cross-cut off the drift and raise in search of ore.

Objective is intersection of the Roaring Lion vein which has a geologic relationship with the Comstock. This work calls for a total of 3,418 feet of drifting cross-cutting, raising and diamond drilling, including the 2,100-foot drift along the Comstock.

Project No. 2: Cost, $89,726. Work will commence on the 200-foot level. It includes 1,000 feet of diamond drilling and 2,650 feet of drifting and raising to find intersection of the Comstock and Odin veins. Location of the ore-bearing sections of the Odin vein is main objective of this project.

Project No. 3: Cost, $138,090. Th's project may be divided into two work problems. Some 500 feet of drilling and 215 feet of raises are planned from the 1,100 foot level up to the 900 foot level. This work will dip into the joint ground which Silver King and Park Utah Consolidated Mines Co. now are developing at depth.

Objective is raising on any extensions on the Silver King property of fissures found productive at deeper levels in the Park Utah ground. The shallow grounds on the Silver King side are not committed to the joint exploration effort at depth of the two firms, but an agreement is being made with Park Utah inasmuch as at the deeper levels some footage must be made in the joint property in order to prepare for raising.

The second part of this project calls for entrance into the Silver King ground at the 900 foot level and raises to the 850 foot level. This will require 700 feet of work on the 850-foot level and 550 feet of work on the 900 foot level, not including 60 feet of raises.

COLORADO

The *Garibaldi Lease*, operators of the *Sunday* lead-zinc-silver mine in the California mining district, Lake county, Colorado have applied to the DMEA for a loan to speed exploration at the Sunday. H. O. Nylene of Leadville is managing partner and R. L. Jones is a partner. Shipments of ore continue to the custom mill unit of the *Resurrection Mining Company* at Leadville.

The *Telluride Mines, Inc.*, Telluride, Colorado, has placed its new ore pass in operation from the Penn level of the *Smuggler* mine to the new Mill level tunnel 1,200 feet lower in elevation. Completion of the orepass and a 500 foot high "water raise" has eliminated the long underground haulage of ore to the portal of the Pennsylvania level and the ¾-mile aerial tramming of ore into the company's 800-ton-per-day Pandora gold-lead-zinc-silver flotation mill. The improvement in ore handling has been under the direction of Charles F. Parker, Jr., manager, and T. E. McCandless, mine superintendent. Meanwhile, the winze from the Penn level has been sunk 180 feet. It will connect with a raise being driven from the Mill level tunnel and will be used as the mine's main service raise. Abandonment of freight service on the *Denver & Rio Grande Southern Railroad* has forced the company to truck its lead and zinc concentrates to Montrose and Leadville, Colorado for shipment to smelters.

The *American Smelting & Refining Company* has completed sinking of its 650 foot winze in the *Eclipse* mine, Leadville, Lake county, Colorado. Sinking of the winze has been impeded by large inflows of water. Following completion of the shaft station, a cross cut has been started toward mineralization found in diamond drill holes drilled from higher underground workings in the Eclipse. S. E. Zelenkov is superintendent of the Eclipse unit and John Mitchell is mine superintendent.

Canyon Gold Company is stoping above the 10th level of its *Rubie* gold mine in the Cripple Creek district, Teller county, Colorado. Work is now in progress on the mine's 9th level to locate the ore shoot being stoped below. Canyon Gold is also driving an intermediate level 90 feet above the *Anaconda Tunnel* to prospect below the bottom workings of the Grace Greenwood shaft. Troy Wade, prominent Cripple Creek mine operator is president of Canyon Gold and is directing the work.

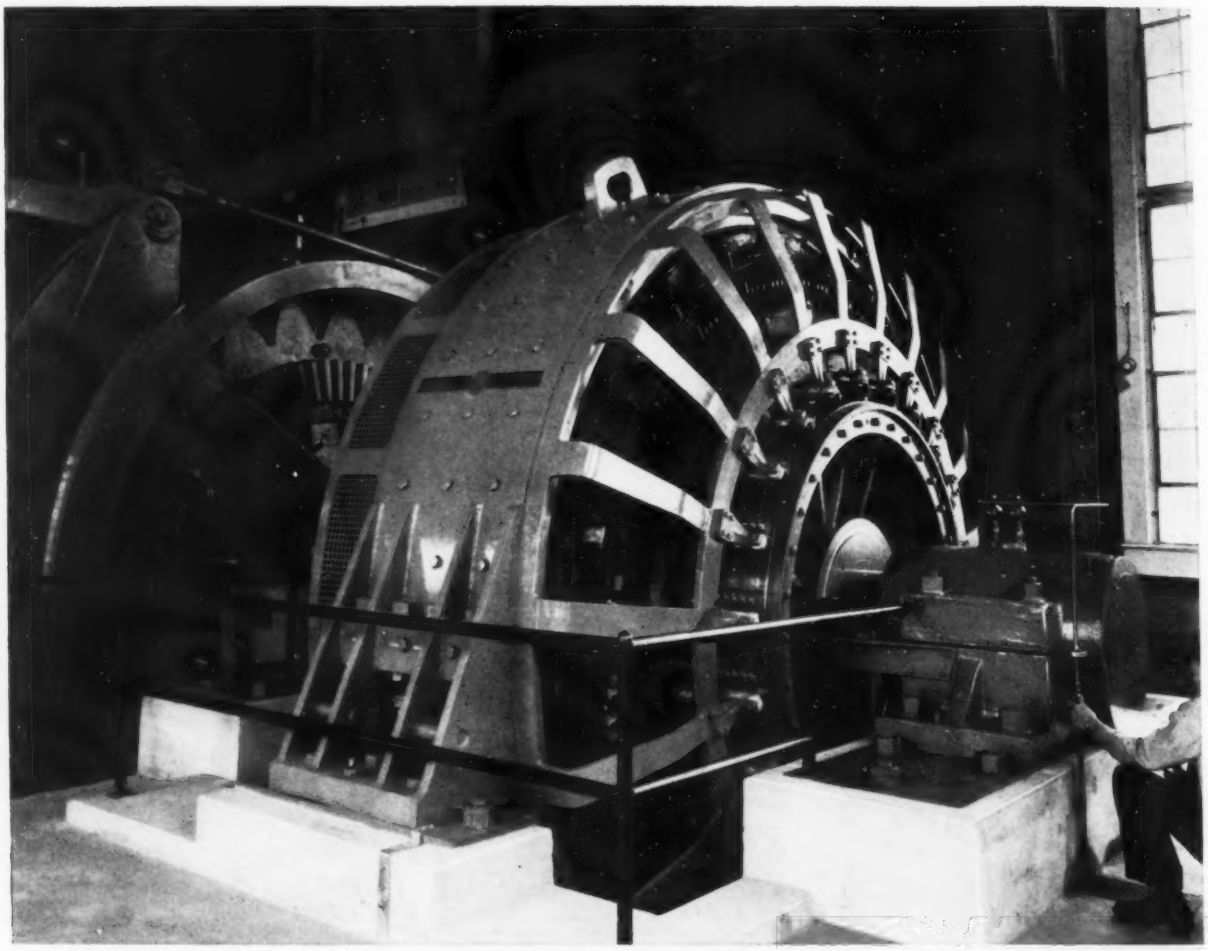
Continued on Page 77

STOCKPILING IRON ORE IN UTAH

Iron ore being delivered from the crushing plant of Utah Construction Company to its stockpile in Iron county, Utah. A lower belt beneath the pile delivers the ore from the stockpile to freight cars where it is shipped to steel mills in Utah and Colorado.

ANACONDA installs one of world's largest hoist motors

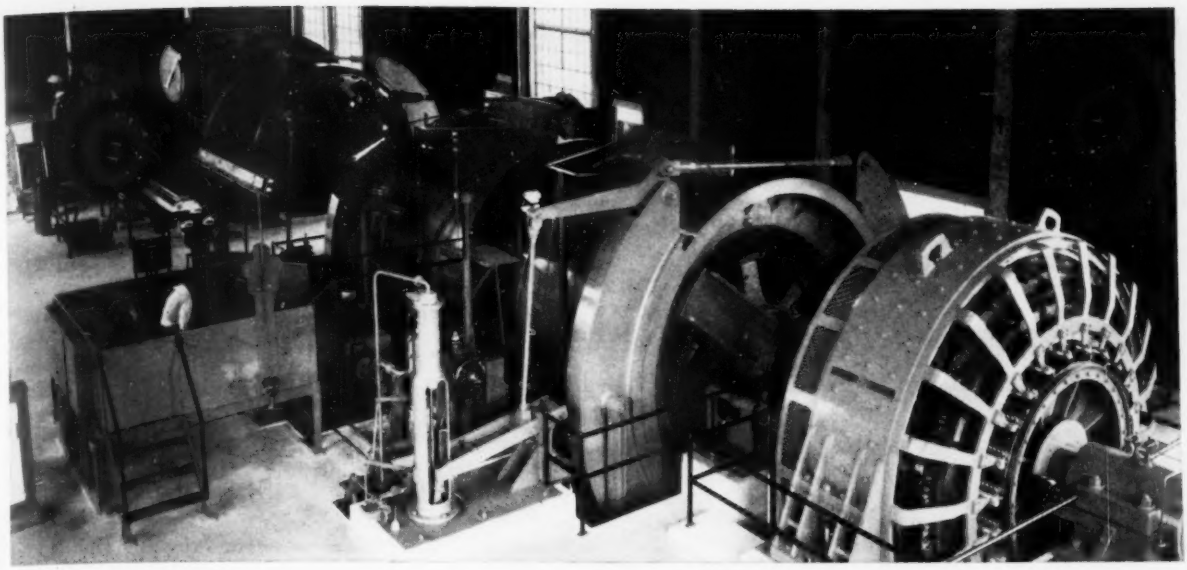
—for high-tonnage low-cost output!



Here it is installed—the G-E 3000-hp 600-volt 60-rpm d-c motor that will drive Anaconda's Kelley Shaft ore hoist. Scheduled to go into production in 1952, it will permit handling much larger tonnages than possible now. Skips, carrying 12 tons of ore per trip, will have a capacity of 853 tons per hour from 868 feet, with approximate power consumption of only 12.4 kwh per trip. From a 4335 foot depth, capacity will be 307 tons per hour, using about 57.3 kwh per trip. New hoist is expected to be able to handle approximately 10,000 tons of low-grade ore per day.

GENERAL ELECTRIC

660-21

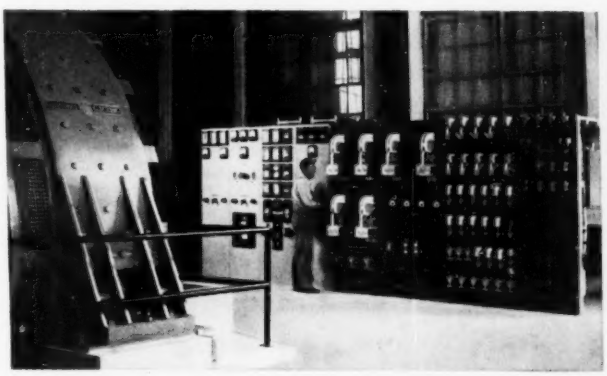


This over-all view shows the G-E 3000-hp motor direct-connected to the hoist's two drums, with the hoist operator at his control station. Expected capacity of the new hoist is 10,000 tons per day, supplemented by the 5000-tons-per-day capacity of the other hoist shown in background.

Complete G-E hoist-drive equipment for Kelley Shaft in Greater Butte Project includes 3000-hp d-c motor, permits lifting 12 tons of ore per trip at low kwh cost

High-tonnage low-cost hoisting is a "must" with Anaconda. Especially so on its Greater Butte Project for the long-range economical mining of an anticipated 130,000,000 tons of low-grade ore by block caving. That's why Anaconda, a satisfied customer since 1913, asked General Electric to supply the main ore-hoist drive in its Kelley shaft —including one of the largest single mine-hoist motors in the world!

General Electric's extensive experience covers over 900 large hoist-drive installations now serving the country's mines, helps explain why companies like Anaconda keep coming back for more of the same. When *you* call in a G-E mining-industry specialist, you put this experience to work for you —profitably. Meanwhile, send for Bulletin GET-1430, "Electric Equipment for Mine Hoists." *General Electric Company, Schenectady 5, N. Y.*



Control for the huge G-E motor is centered in this panel, built throughout to meet specifications laid down by Anaconda. Designed for either manual or automatic hoisting, the drive will operate two skips in balance, at a speed of 2250 feet—almost half a mile —per minute.

New G-E Motor Selection and Application Course can help train your mine and mill workers, increase their efficiency. A G-E "More Power to America" program, it shows how motors work, types in use, and how to select and apply them. Write now for Bulletin GEA-4938-16 describing the course in detail.

GE MINE-HOIST DRIVES

In addition to hoist motor and control panel, the G-E drive equipment includes this motor-generator set to supply the needed d-c power. It comprises a 2500-kw 600-volt d-c generator driven by a 3500-hp 514-rpm 2400-volt synchronous motor, and a 60-kw exciter.

Rocky Mt. News

Continued from Page 73

The *American Zinc, Lead and Smelting Company* is pushing development of its leased *Caledonia* mine six miles north of Silverton, San Juan county, Colorado. Stoping is expected to be started in a few weeks and the zinc-lead ore will be trucked to American Zinc's American No. 1 differential flotation custom mill at Ouray, Colorado. R. H. Miller, of Ouray, is general superintendent of Colorado operations for American Zinc.

Colorado Standard Lead-Zinc Mines, Inc., a subsidiary of the *Lucky Tiger Combination Gold Mining Company*, has placed its rehabilitated 100-ton flotation mill in operation at the *Ute and Ulay* mine on Henson Creek, Hinsdale county, Colorado, according to J. B. Kassebaum, company president. Reopening of the mine and rehabilitation of the mill are ahead of schedule and shipments of lead-silver, and zinc concentrates are being made to Leadville, Colorado and Amarillo, Texas smelters. A crew of 43 men is employed in the mine and mill.

The *Empire Zinc Company* through its parent company, *New Jersey Zinc Company*, has been awarded a certificate of necessity for accelerated amortization of zinc ore producing facilities at its *Eagle* mine at Gilman, Eagle county, Colorado. The certificate covers facilities which were partially completed before September 23, 1950.

The *Consolidated Feldspar Company* has purchased the 100-ton-per-day, dry-grinding feldspar plant of the *Western Feldspar Milling Company* in Denver, Colorado. Consolidated also has purchased several Colorado feldspar quarries from *M. & S. Inc.*

The *Ozark-Mahoning Company* is pushing construction of its new 250-ton-per-day fluorspar flotation mill five miles north of Cowdrey, Jackson county, Colorado. The unit is expected to be in operation in May 1952. Plans are being made for the future construction of a second 250-ton unit. Roy Hickman of Tulsa, Oklahoma is in charge of the operation, with Mike Cloonan of Cowdrey as general manager. The company is also erecting a number of employe houses near the mill. Underground mine development is being pushed during the winter months under the supervision of Gordon Miner, mine superintendent, so that stoping can be started early in 1952.

An additional open-hearth furnace of 160,000 tons annual capacity is about to be placed in operation at the Geneva, Utah steel plant of the *Geneva Steel Company* (*United States Steel Corporation* subsidiary). New facilities for production of hot rolled sheets are to be ready later this year.

Snyder Mines, Inc. of Salt Lake City, Utah is diamond drilling in the Mercur mining district, Tooele county. Two surface drills are engaged in the work which is designed to determine the location, in depth, of the Ophir limestone. This limestone contained lead-zinc-silver orebodies along the surface and at shallow depth. The present geologic drilling is an attempt to find similar orebodies down dip from those mined at Ophir. E. A. Snyder of Salt Lake City is president and general manager of Snyder Mines.

The *Wyoming Gulf Sulphur Company* has placed its new sulphur flotation mill in operation outside Cody, Wyoming. W. H. Marquette, president and general manager, announced that about 20 tons per day of sulphur concentrate is being produced. Mill feed is mined by the company from an open pit adjacent to the mill.

Production of trona continues on a development scale at the *Westvaco* mine of the *Westvaco Chemical Division* of the *Food Machinery & Chemical Corporation* at Westvaco, Sweetwater county, Wyoming. The firm has received a certificate of necessity for $16,300,000 for the construction of a soda ash plant adjacent to the mine shaft to use with trona as the raw material. The plant is scheduled for operation in 1953. C. A. Romano is resident manager, N. E. McDougal is general superintendent, and G. B. Gaylord is mine superintendent.

precipitates—NORTHWEST

Greater Butte Project To Be Overshadowed In Future

Cornelius F. Kelley, chairman of the Anaconda Copper Mining Company, recently announced that operations at the company properties in Butte, Montana, will be enlarged to further develop the mineral wealth of the "richest hill on earth."

Kelley said that the present development program—the Greater Butte Project and the Alice-Lexington tunnel and ancillary workings (the latter is scheduled to bring the old Black Rock-Elm Orlu section of the famous Rainbow Lode into production)—is but a forerunner of still greater projects.

Every foot of underground work through what was once considered barren country rock has been carefully sampled and assayed for many years, Kelley added. From the data gathered, he predicted that the mineral wealth of Butte will not only enable it to maintain its position as a major copper producer, but will, without any doubt, enable it to become the greatest producer of zinc and manganese in the United States.

Atlas Prepares For Shaft Sinking

Stockholders of the Coeur d'Alenes Lead Company, Wallace Idaho, have voted to dissolve the corporation and to distribute its assets among the shareholders, according to Joseph W. Greenough of Spokane, company attorney and a director. Principal asset is 500,000 shares of Atlas Mining Company stock which will be divided on the basis of approximately one share for each four and one-half shares of Coeur d'Alenes Lead stock.

Prior to May 1951, there had been no exploration activity at the Atlas property for a number of years. Under terms of an agreement between Hecla Mining Company and Atlas; and under companion agreements between Hecla, Atlas, Newmont Mining Corporation, the New Jersey Zinc Company and subsidiaries of the latter two companies, a major exploration program under Hecla's operational charge was initiated to make a deep test of the Atlas vein system.

Substantial progress has been made. New surface buildings and a plant have been installed; sections of the main adit crosscut, which extends 9,200 feet from portal to underground shaft station, have been improved in alignment, grade, and size; new heavy track has been laid; new cars and a Diesel haulage motor are in operation; an electric power cable has been laid to the underground station; and, currently, work is in progress on the cutting of a new and larger hoist room and its companion rope raise. Actual sinking of the present 3-compartment, 800-foot shaft, down to the planned 2,400-foot level, should be underway early this year, and the 2,400 level should be reached by March 1953.

Idaho Birthday Mines Company has almost completed driving a new development and drainage tunnel at its property near Lowman, Boise county, Idaho. The new tunnel will undercut at depth several veins that have produced gold-silver ore from shallow workings. Idaho Birthday was formed to acquire and to operate holdings of the former *Birthday Consolidated Gold Mines, Inc.* Eastern interests are reported to have invested $100,000 in the new firm. The company controls 54 mining claims in the district, designated as the *Birthday, Branson,* and *Payette* groups, and also a *Homestead* adjoining the claims. The company also holds 200,000 shares of stock in the *Index Mining Company* with properties at Spruce Mountain, Nevada. Extensive development work is going on at many of the Idaho claims. Construction of a concentration plant is planned following completion of the tunnel.

Signal Mining Company has reopened the old *Hilarity* mine at the mouth of Denver Gulch in the Pine Creek district of the Coeur d'Alene mining region, Idaho. The shaft has been unwatered and ore is being broken from stopes above the lowest 200 level. At present prices of zinc and lead, an estimated 18,000 tons of ore is available for mining. Plans call for treating the ore in the Amy mill on Pine Creek. Gene Iverson is in charge of operations.

Sullivan Mining Company has started deepening its *Star* mine shaft near Burke, Idaho, 800 feet below the present 5,500 level, according to general superintendent Ralph W. Neyman. The Star is Idaho's largest zinc producer. Negotiations were reported under way recently to develop holdings of *United Lead-Zinc Mines,* east of Wallace, through a crosscut from Star workings.

Bradley Mining Company has won a $21,117 suit brought against it and a co-defendant contracting company by the Federal Government. The government charged company negligence in a fire which spread from its *Ima* tungsten property to timber in the Challis national forest. A federal judge in Boise, Idaho ordered a directed verdict in favor of the company.

Hypotheek Mining and Milling Company, which is exploring fringes of the old *Hypotheek* mine in the Pine Creek district of the Coeur d'Alenes, has found lead-zinc ore in the adjoining *King of Pine Creek* property it purchased last year. The discovery was made in an old upper tunnel 80 feet beyond the point where earlier operators had given up.

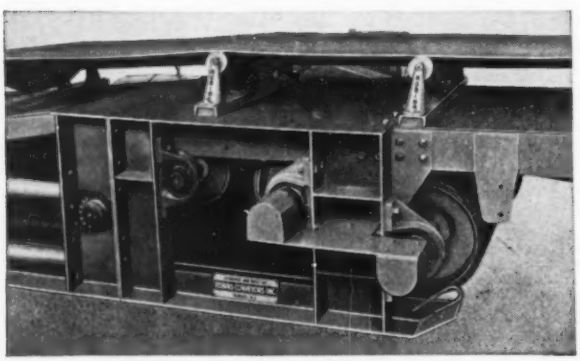
Day Mines Inc., will do more than 5,000 feet of tunneling under its $288,000 *DMA* copper-lead-zinc exploration project in the 40-year-old *National Cop-*

Continued on Page 82

NEW ADVANCE MILL PRODUCING

Mines Management, Inc. has put its new 60-ton Advance mill into production. The flotation plant is located on Sheep Creek 1½ miles north of Northport, Washington. Zinc and lead concentrates are trucked to Consolidated Mining and Smelting Company's smelter at Trail, British Columbia. Equipment includes an Eimco ball mill, a Pacific crusher, and an Oliver filter. The state of Washington has built a three-mile, mine-to-market road from the Advance mine to the Leadpoint-Northport highway. A new compressor house and a miners' change room have been built at the mine and new machinery installed. Ore lies in a bed in the Metaline limestone, just below the Ledbetter slates.

ROOM...GRANDMOTHER...OR SLOPE

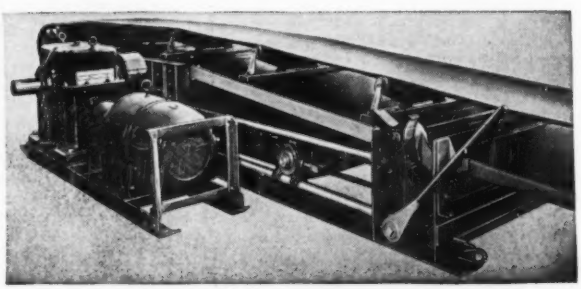


SINGLE OR TANDEM DRIVE

Hewitt-Robins Mine Conveyors come equipped with both single and tandem pulley drive elements. Provide ample horsepower for lift and length up to the very limits of belt capacity. Reeving of belt handles level, uphill or downhill service requirements.

UNIFIED DRIVE SECTION

Motor, reducer and controls mounted on a single base—skid-designed for easy moving about. Can be located on either side of the conveyor. Drive reversible—incoming for men and material, outgoing for high output of product.



there's a Hewitt-Robins Mine Conveyor to meet your specific requirements

Solve your underground conveying problems the easy, economical way. With a choice of THREE types of Hewitt-Robins Mine Conveyors, you are sure to get exactly the equipment you want.

TYPE I has *internal* drive for level or *up*hill operation; in 26", 30", 36" and 42" widths—lengths to 3000 feet or more.

TYPE IS has *internal* drive for level or *down*hill operation; in 26" and 30" widths—lengths to 3000 feet or more.

TYPE H has *head* drive for level or *up*hill operation; in 26" and 30" widths—lengths to 2000 feet.

Intermediate Sections are standard, fit all three types. Assembly is easy—both ends are identical, need no "matching up." Made in 8' and 10' rigid and demountable sections. Also available are Intermediate Channel Sections in 12' lengths—30", 36" and 42" widths.

Only Hewitt-Robins can offer you a complete mine conveyor "package"—machinery *plus* belt, motor, reducer and drive! You can order equipment to fit your needs to a "T"—single or tandem pulley drive . . . internal or tail takeup . . . the famous Ajax® heavy-duty belt, in the required length and width.

The sturdy machinery is built for the toughest kind of service. You get ball or roller bearing, one-shot lubrication idlers . . . lagged pulleys for maximum power transmission . . . a conveyor backed by over half a century of engineering and manufacturing experience. And, only Hewitt-Robins leaves you worry-free—takes complete *unified* responsibility for successful performance of machinery *and belt!*

Make sure you get the best for your money. Write for detailed specifications. Address:

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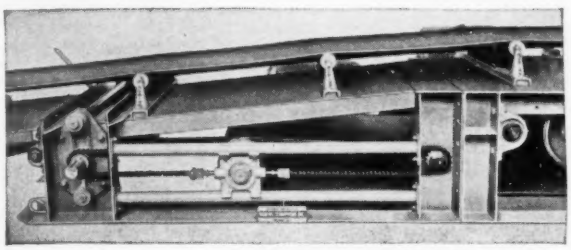
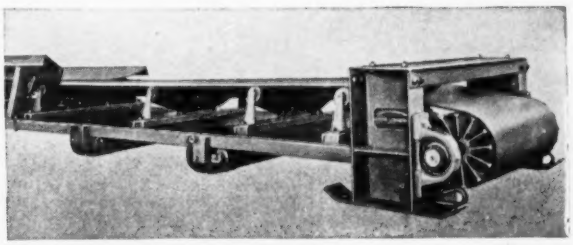
270 Passaic Ave., Passaic, N. J.



INTERNAL TAKEUP

Located directly back of the drive. Handles 10' of belt slack. Operated by reversible ratchet-wrench working on gear reduction to minimize manual effort. Arranged so an automatic counterweighted gravity take-up can be added if desired—eliminating manual adjustment. Double-acting pawl prevents back-up.



TAIL SECTION

Telescopic type to provide tail takeup action. Easy to clean out—no steel work under tail pulley. Has transverse cover to protect pulley, bearings and belt. Strong enough so that you can rest a feeder on it.

For ore service Hewitt-Robins has special, heavy-duty conveyors proved able to withstand this rugged service.

HEWITT-ROBINS
MINE CONVEYORS

Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation.

HEWITT-ROBINS INCORPORATED

BELT CONVEYORS (*belting and machinery*) • BELT AND BUCKET ELEVATORS • CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS • FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS • RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS • TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

Northwest News

Continued from Page 79

per tunnel northeast of Mullan, Idaho, according to President Henry L. Day of Wallace. The work will intersect at depth, veins of the old *Missoula Copper* and *Copper King* mining companies. Old National Copper workings will be reclaimed and re-examined for possible remaining ore bodies. Day Mines has reopened the 4,500-foot main crosscut and enlarged the last 500 feet. National Copper was a substantial producer more than 30 years ago and the Copper King yielded some ore from upper workings in the early 1920's. Day Mines has also announced its participation on a 25 percent basis in *American Smelting and Refining Company's Silver Buckle* exploration project, west of Wallace. The company had previously taken a 25 percent participating interest in ASARCO's deep development project at the adjoining *Vulcan Silver-Lead* property. Extensive repair work to the 5,000-foot-long *Gold Hunter* adit east of Mullan has been completed by Day, in preparation for attempting to unwater and rehabilitate the old 1,200-foot vertical shaft. Plans call for utilizing the shaft in exploring at depth Gold Hunter ground and adjoining *Independence Lead Mines* ground. Deepening of the *Dayrock* mine shaft 300 feet has also started. The company's *Tamarack* mine shaft will be deepened the same distance this winter and an oil set hoist and compressor are being installed.

MONTANA

The *Victor Chemical Works* has started phosphorous production at its *Silver Bow* plant in Silver Bow county, Montana. Development at the company's *Maiden Rock* mine across the Big Hole River from the *Canyon Creek* mine is continuing. Combined output of the two mines is planned at 600 tons a day. C. G. Derick, Jr. is manager of Montana operations; William Anderson is superintendent of mines; and Henry Johnson is mining engineer.

The *American Alloy Metals Incorporated* is starting an underground exploration program at its tungsten claims near Glen, Beaverhead county, Montana. Winter has forced suspension of surface diamond drilling. Development to date has indicated a large deposit of tactite-bearing scheelite. Widths up to 60 feet have been found. Frank Eichelberger of Spokane, Washington is managing partner for the corporation.

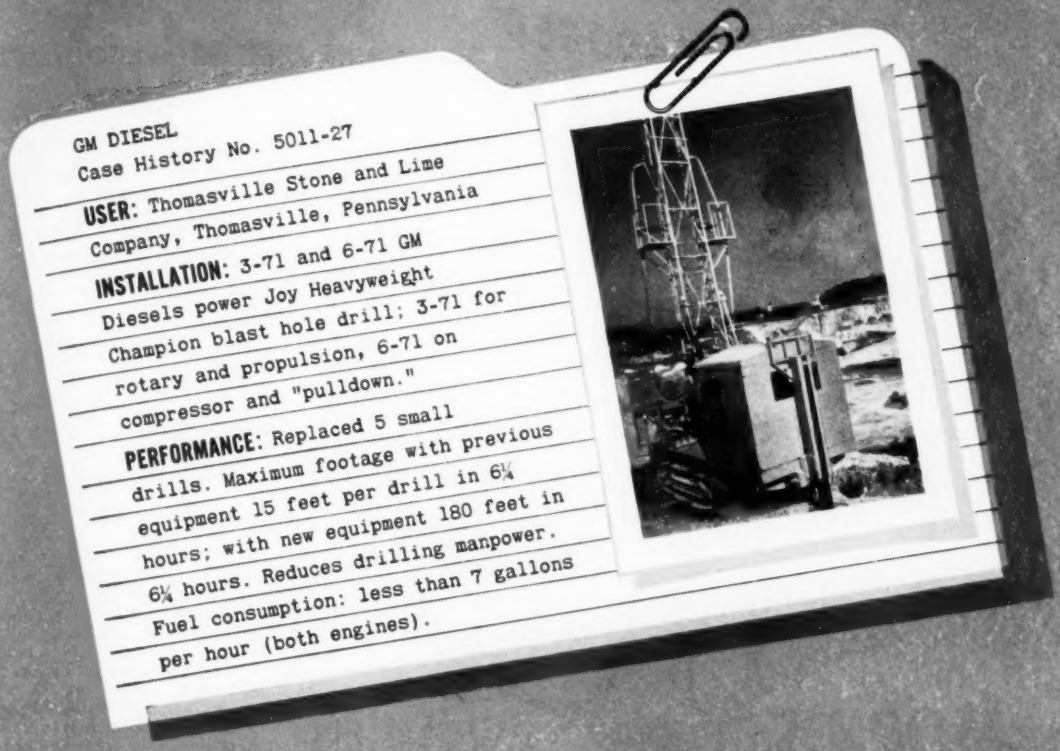
Double Eagle Tungsten Company is planning to erect a mill at its Black Pine district tungsten property in Granite county, Montana, according to William R. McLure, president. Exploration has been carried out with the aid of a $12,286 DMA loan. The company also expects to sink an inclined shaft.

Williams Phosphate Corporation has taken over the *Mountain Meadow* phosphate deposit on Ruby River near Alder, Montana. A drift has been run over 200 feet on the hanging wall of the vein and plans are to extend this drift another 1,000 feet with a crosscut every 100 feet. A primary crusher and ore bin are to be installed and the ore will be stockpiled. Griff Williams of Sheridan, Wyoming, is president.

The *Boaz Leasing Company* formed by a group of Norris, Montana, and Seattle, Washington business men and headed by Robert Fox, has taken a lease and bond on the *Shafer* mine near Argenta, Montana. They are driving an 800-foot adit crosscut to explore in depth showings of high-grade gold and silver ore found in workings at a higher elevation.

Interest in the *Hunter* mining district around Mullan, Idaho, has extended into the adjoining Mineral county in Montana. More than 200 claims were staked in September, October and November, records in the county auditor's office showed. *Hecla Mining Company* of Wallace led with 80 locations, followed by *Coronado Copper and Zinc Company* with 49.

U. S. Gold Corporation has cut a four-foot-wide vein in a 2,000-foot crosscut under old shallow workings at its property in Madison county, Montana. According to company officials, assays of samples cut across the face reportedly showed gold, copper and silver. This strike, together with engineer's estimates of ore in upper levels, has encouraged the firm to order $25,000 worth of machinery needed to get its 250-ton mill into production next spring. A. Pat Clark, formerly of Spokane, is vice president and resident manager. The property, in



This Diesel replaces five drills

— and more than doubles the footage

Case after case proves that *any* machine with General Motors Diesel power is a *better* machine —gets *more* work done at *lower* cost. Using General Motors 2-cycle design—this Diesel packs more power per pound, runs smoother and accelerates faster. Result—greater production per hour! With most parts interchangeable and easy to replace—GM Diesels take less time out for servicing, cost less to maintain. Check it with other operators—*prove it for yourself* by specifying GM Diesel power in any equipment you buy.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS, DETROIT 28, MICHIGAN
SINGLE ENGINES...Up to 275 H.P. MULTIPLE UNITS...Up to 800 H.P.

It pays to Standardize on

GM
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the Tobacco Root mountains 30 miles north of the Virginia City gold camp, is held under lease and option from *Inspiration Gold Company* of Butte.

OREGON

John and Robert Fox of Seattle, Washington and an associate have purchased the *Buffalo* mine at Granite, Grant county, Oregon. The Buffalo has been a high-grade gold producer for a number of years. R. G. Amidon, mine superintendent, has established a winter camp and will continue stoping and operation of the 50-ton-per-day mill during the winter months. A lower adit is planned 600 feet below existing mine workings and will probably be started in the spring of 1952.

First DMEA approvals in Oregon are a $34,727 antimony project for E. E. Stauffer's *Cayote* group near Brogan, and a $30,000 copper project for *Waite Minerals, Inc.*, at Josephine.

G.M.C. Mining and Milling Company is reported to have built a concentrating plant near Eagle Point, Jackson county, Oregon, for the treatment of chromite and manganese ores. The company owns the *Tyrrell* manganese mine in the Lake Creek district east of Eagle Point, and will obtain chromite ore from the *Sordy* mine in the Briggs Creek area near Galice, Josephine county. The company plans to accept custom ore, as well as ore from its own properties. Equipment includes an 18 by 30-inch jaw crusher, a 100-foot conveyor to transport ore from the crusher to the 200-ton ore bin, a large ball mill, Dorr classifier, jigs, and concentrating tables. It has a daily capacity of 350 tons of ore. J. C. Larsen, George McKay, H. Harmes, James Bodenhamer, all of Sacramento, California, and Lester L. Sibley, managing engineer of Medford, Oregon, form the company.

WASHINGTON

Pacnor Mines, Inc., a new Spokane, Washington firm, has taken over 47 mineral claims in the Russian Creek area of the Metaline mining district and plans to acquire other Pacific Northwest properties, according to Karl W. Jasper, one of the incorporators. The claims, adjoining ground located last spring by *Day Mines, Inc.*, of Wallace, Idaho, were staked by a syndicate composed of Jasper and two other mining men. Pacnor Mines is incorporated for $200,000. Incorporators included Graham D. Lammers, Alaskan gold operator, and Cline E. Tedrow, Metaline Falls Mining engineer.

George Shallenberger, Spokane mining man, has announced he is in the market for Pacific Northwest iron ore for the *Twin Peaks Corporation* of Salt Lake City. The ore must have 50 to 60 percent iron content.

The *American Smelting & Refining Company* has awarded a stripping contract at its *Van Stone* mine in Northern Stevens county, Washington to the *Isbell Construction Company* of Reno, Nevada.

Saginaw Dock & Terminal Co. reports that

Belt reinforced with "Cordura" rayon holds trough on long slope conveyor

STRONGER AND THINNER, this "Cordura" rayon reinforced belt measures 912 feet between centers. It can deliver 2½ tons a minute up a 245-foot lift on a 16 degree slope. Driven by a 50-horsepower motor through a gear-speed reducer, it travels at a speed of 280 feet per minute.

Under any loading condition, this 30-inch slope belt at Saginaw Dock and Terminal Company's #1 mine at St. Clairsville, Ohio, trains perfectly. It was manufactured by the Goodyear Tire and Rubber Company on a 4-ply fabric carcass made of Du Pont Cordura* High Tenacity Rayon.

Why do belts train better when reinforced with "Cordura" rayon? Here's the reason. "Cordura" rayon yarn is stronger than yarn of natural fibers. It will make a belt full strength with fewer plies. These thinner belts are more flexible and so trough better. Besides, the low stretch of "Cordura" rayon saves costly shut-downs for take-up and resplicing.

Before you order your next conveyor belt, be sure to look into the advantages of belts reinforced with this heavy-duty Du Pont yarn. We'll be glad to send you a list of the names of suppliers, and full information about "Cordura" rayon in a new booklet, "Sinews for Industry." For your free copy, address: Rayon Division, Room 4421, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

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Du Pont "*Cordura*" High Tenacity Rayon

STRENGTH AT LOW COST

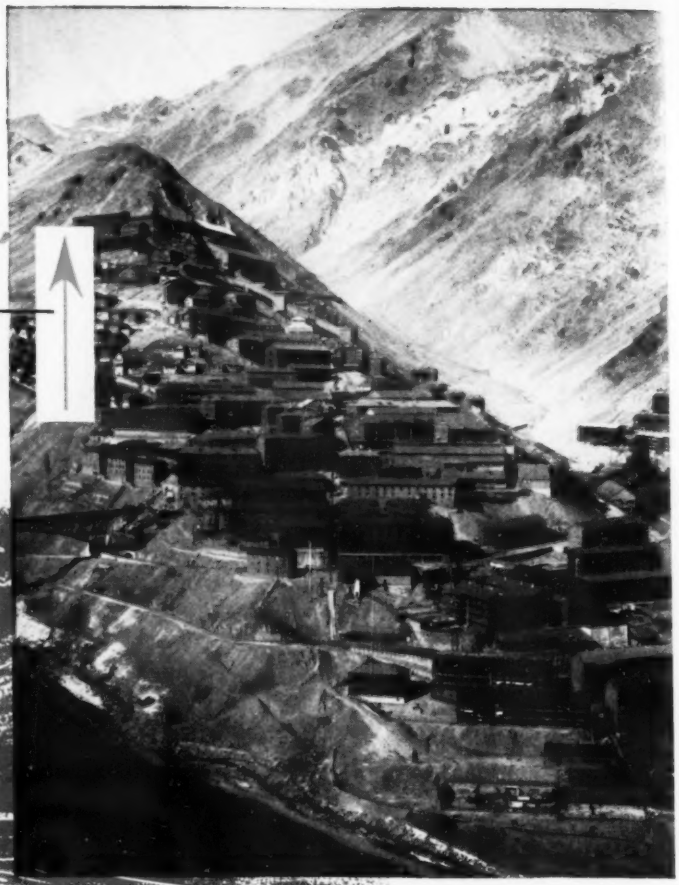
DU PONT

BETTER THINGS FOR BETTER LIVING ... *THROUGH CHEMISTRY*

Mining Copper "UPSIDE-DOWN"

in the ANDES MOUNTAINS

In the lofty Uspallata Pass of the famed Andes Mountains, almost 13,000 feet above sea level, stands the huge bronze *"Christ of the Andes"*, marking the boundary between Chile and Argentina.

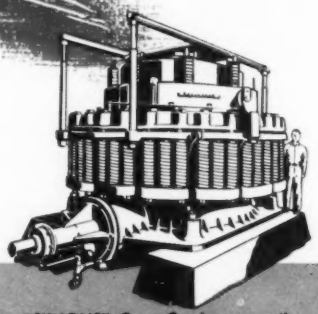


THIS interesting view shows Sewell, the upper mining camp of El Teniente Mines of the Braden Copper Company . . . carved in the western slopes of the Chilean Andes, at an elevation of 7,000 feet.

El Teniente Mine is unique in that it is "upside down". The ore occurs high up on the mountain side and is dropped some 2,000 feet through chimneys in solid rock to an adit tunnel haulage way. Miners and supplies are hoisted, rather than lowered, to their working places.

The crushing plant at Sewell includes twelve *"SYMONS"* Cone Crushers which reduce all ore mined to less than 3/8" diameter for further treatment.

No matter where you travel in the Mining World . . . from the Andes Mountains to the Zambesi River country . . . you will find *"SYMONS"* Cone Crushers the outstanding choice among the world's leading producers of ores and industrial minerals.



"SYMONS" Cone Crushers . . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

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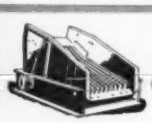


"SYMONS" Vibrating Bar Grizzlies and Screens

Diesel Engines

Isbell has moved in large equipment and plans to continue stripping of the 500,000 cubic yards of overburden during the winter and early summer of 1952. Isbell will probably mine the zinc-lead orebody after the new mill is placed in operation. All concrete foundations at the new 1,000-ton-per-day mill have been poured and erection of steel is progressing on schedule. Completion date of the mill has been set for 1952. Mill design and construction is under the supervision of Norman Weiss, manager of ASARCO's milling operations, and mining is under the direction of J. Fred Johnson, manager of operations, western mining department. P. A. Lewis is Van Stone superintendent.

The *School of Mineral Engineering, University of Washington*, will hold its 25th Annual Mineral Institute Industry meeting on February 21. The general topic will be "Strategic and Critical Minerals."

Grandview Mines has recently acquired approximately 9,000 acres of mineral rights in Stevens county, Washington, around the Leadpoint area. This is not under lease to any other company at the present time. Grandview is doing its own preliminary exploration work.

Three tungsten prospectors, Wesley Boggs, Ione, Wash., Ernest Boggs, Cusick, Wash., and Alexander Best, Deer Park, Wash., have taken a 10-year lease on a quarter section south of Deer Park. They reported finding evidence of a commercial tungsten deposit.

An estimated 40,000 tons of low-grade, zinc-lead ore have been opened on the 250-foot level of the *Farmer* mine in Stevens county's Northport mining district, Washington by C. W. and Norman Hartbauer, lessees. Additional development is planned under a $10,000 DMEA exploration project. Mill construction next year is under consideration.

The *American Zinc, Lead and Smelting Company* is continuing open-pit mining at its new *Leadhill* property in the Metaline district of Washington despite heavy snows. Ore is being trucked 13 miles to the company's *Grandview* mill. American Zinc has recently acquired the *Bluebird* group of 17 claims on Slate Creek. Thirty-one claims adjoining the property have also been staked. The two groups are midway between the company's Leadhill and Grandview mines. The latter is operated on a 50-50 profit-sharing agreement with *Grandview Mines* of Spokane, Washington. The Bluebird claims were taken on lease and option from William Dumont who has prospected the ground, George Dumont of Seattle, and Howard L. Kimmel of Newport, Washington.

Slate Creek Mining Company is planning to build a new hydroelectric plant and to make improvements on its mill at the *New Light* gold mine in Whatcom county, Washington. Norman L. Lindsley, Seattle mining engineer, is in charge of the current program to get into production in 1952. Ore bins are reported to be full.

Admiral Consolidated Mining Company of Spokane, Washington, has made three shipments of zinc concentrates to *Cominco's* smelter at Trail, B.C. since taking over operation of its previously leased Stevens county mine in September, according to Mrs. J. Richard Brown, secretary-treasurer. Winter operations are continuing. Kenneth Akers of Leadpoint, Washington is mill superintendent, and Ernest Woodard, also of Leadpoint, is mine superintendent.

precipitates—SOUTHWEST

American Zinc Leases Piedmont's Hilltop Mine

The American Zinc Lead and Smelting Company has leased the properties of Piedmont Mines, Inc. in Cochise county, Arizona. The sale involves approximately 32 claims known as the Hilltop mine, near Portal, Arizona.

The Hilltop was a major producer in 1924-1926, with a production record during that period of 5,000,000 pounds of lead, plus $50,000 in silver, for a total value of $500,000. In addition, several cars of lead-zinc ore were shipped in 1950-1951, following its acquisition by Piedmont Mines in 1948.

Development work is said to consist of about 11 miles of drifts and tunnels. The new development program will be directed by Dick Britton, recent graduate of the School of Mines, University of Arizona. The entire project will be supervised by Ralph Calhoun of El Paso, Texas. American Zinc plans to send ore shipments to the Peru mill at Deming, New Mexico, owned by Peru Mining Company, with the concentrates going to American Zinc's smelter at Dumas, Texas.

California Tungsten Firm Completes DMA Contract

Officials of the Defense Minerals Exploration Administration reportedly have advised Colonel G. McGuire Pierce managing-owner of the U.S. Tungsten Mines, that his company is the first in the nation to complete all of the scheduled work under a tungsten exploratory loan program. The actual work was completed on November 1 and an additional month was spent in securing the camp against heavy winter snows.

The program, consisting of surface trenching and diamond drilling, indicated an ore body in excess of 50,000 tons of scheelite ore. The deposit is said to be ideal for open-pit mining and this method will be employed when work is resumed in the spring. The proven ore body is on one of 21 claims controlled by U. S. Tungsten in the Dinkey Creek area of Fresno county, California. Each of the other 20 claims has promising scheelite-bearing tactite outcrops and an extensive exploratory and development program on these properties is also contemplated.

Plans are now being made to construct a 100-ton-capacity concentrator at Dinkey Creek in the early spring to handle their ore, as well as custom ores.

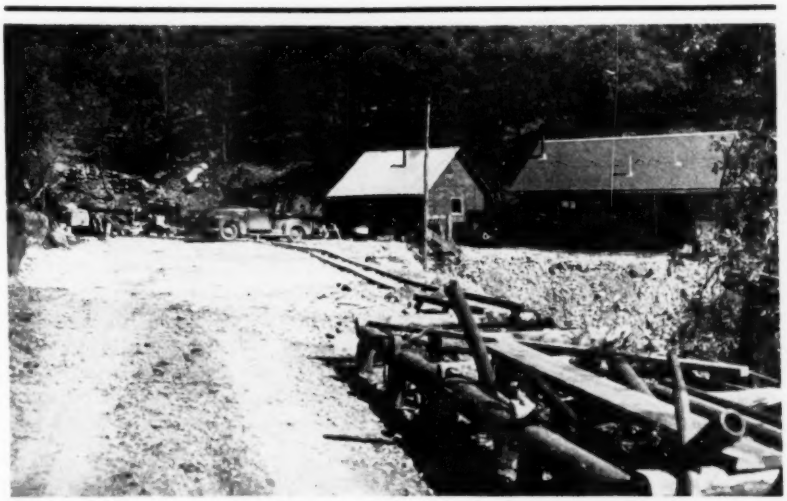
ARIZONA

The *Defense Minerals Exploration Administration* has approved an exploration loan for the *Abril* mine, near Tombstone, Arizona, operated by Sherwood B. Owens. Estimated cost of the project is $63,926, of which the government will provide $31,963, or 50 percent. It is presumed that the exploration contract is for the purpose of further developing the copper and zinc potentialities of the Abril. The mine has been operated under lease by Owens since February, 1951. He has been shipping from three to six carloads of ore each week.

The *Copper Hill Mining Company, Inc.*, Globe, Arizona, has taken over under lease and option the properties formerly operated by the *Superior and Boston Mining Company*. These holdings consist of 691 acres of patented ground, five miles northeast of Globe. Total production from the claims is estimated at $10,000,000, mostly in copper ores mined prior to 1926. During World War II, the property produced about 4,000 tons of manganese ore for a return of $125,000. First work by the new operators will be for the production of manganese, and a shaft is being sunk on one of the four manganese veins. One manganese vein is said to have been proved to a depth of 600 feet by diamond drilling, and a second vein to a depth of 414 feet by underground work. Later on, development of the copper potentialities will be undertaken. Principals in the Copper Hill Mining Company are: T. R. Black, president, Tipp City, Ohio; T. R. Black, Jr., vice-president and treasurer; and L. O. Goodman, secretary, Globe.

The *Phelps Dodge Corporation* estimates that its mine output for 1951 totaled about 500,000,000 pounds. The company is readying its *Lavender* open pit *"Bisbee East Orebody"* at Bisbee, Arizona, for production. This ore body contains 41,000,000 tons of ore averaging about 1.14 percent copper content to the ton, and 31,000,000 tons of leaching ore averaging 0.42 percent copper. To bring the mine into production within four years, the estimated cost will be about $25,000,000.

Stripping operations are expected to start shortly at the *Silver Bell* copper property of *American Smelting and Refining Company*. The project was made possible by the signing of an agreement with the *Defense Materials Procurement Agency*. The Silver Bell is to be converted into an open-pit mine, with the pit measuring 1,500 by 2,000 feet. Trucks will be used to take the ore to the concentrator, and also to haul the concentrates to the railroad siding for shipping. It will be necessary to construct complete camp facilities, including housing, offices, shops, and flotation mill. Initial plans call for the erection of about 100 homes for company employees. It is estimated that about 750 men will be employed during the construction period and about 400 when production starts. The company hopes to start production within 18 months to two years. The Silver Bell is located about 45 miles northwest of Tucson. Under the agreement with the DMPA, if the company is unable to sell the copper from the Silver Bell on the open market for 24.5 cents a pound, f.o.b. Connecticut Valley points, the government will buy at that price up to 177,000,000 pounds of the first 197,000,000 pounds produced. Production is expected to get under way in about two years. The government's responsibility to buy the copper expires



ARIZONA'S MOUNT UNION MINE PRODUCING

The Reorganized Silver King Divide Mining Company has completed a 1,332-foot operating tunnel to reopen its Mount Union mine near Prescott, Arizona. The tunnel, which cut the old shaft at the 515-foot level, is 6 by 8 with 24-pound rail. A 2-compartment raise has been completed to the 400-foot level and stoping is in progress on its north side. The company has been making shipments of selected high-grade ore and development work is continuing.

after 5½ years from the start of production. Cost of the project is estimated at $17,000,000. It will be financed entirely by American Smelting and Refining.

The *Webb* mercury mine in the Patricks Creek region near Crescent City, California, is reported to be in operation. A rotary furnace, crushers, condensers, and other units have been installed by *Harmes Mining Company*, operators of the property.

Lomar Milling Company has reopened the *Petersen* gold mine in the Pine Grove district of California. Old workings are being rehabilitated and development work will be conducted beyond the old productive areas. The property is owned by William F. Petersen and Mrs. Martha Petersen Culbert. Lomar is controlled by H. P. Livingston and W. L. Metcalf.

Holiday Mining Company is hauling chromite from its *Holiday* property near Crescent City, California.

Blanche F. Brown and Joseph G. Brown of Cathedral City, California, have purchased the *Depot Hill* mine near Downieville, California, from the heirs of the late Frederic J. Joubert. Future plans include hydraulicking of the auriferous gravels.

The *Reed* mercury mine in the Knoxville district, 25 miles northwest of Monticello, Yolo county, California has been dewatered and the size of the crew has been increased to seven men. They are now engaged in mucking, retimbering, and in a general effort to work their way northwestward to the old headings. Progress is slow and no production is expected before the middle of the year. *Bradley Mining Company* of San Francisco opened up the property last March after several years of inactivity.

Placer mining is being conducted 14 miles north of Nevada City, California by *San Juan Gold Company*. The company is seeking water permits for mining purposes from the *California Division of Water Resources*. The company controls mines and channels located near the *Malakoff*, once the world's largest hydraulic gold mine.

Consolidated Manganese Corporation of San Francisco, California is developing a manganese property near Mt. San Hedrin, northwest of Ukiah, California. The company holds nine claims with manganese showings on the surface and in a shallow shaft. As soon as 1.5 miles of truck road can be completed to the mine, shipments of ore will be started to a government purchasing depot.

Construction of the 11,000-ton-daily leaching plant has started at *Anaconda Copper Mining Company's* huge project at Yerington, Nevada. A $2,500,000 contract has been awarded to *Weichman & Probasco Construction Company* of Reno for a housing project. Plans call for construction of housing to accommodate 235 families and 110 single men, along with power, water, and sewage facilities. A mess hall capable of feeding 125 men will also be constructed and managed by W. T. Swafford Company, Inc.

The *Copper Canyon Mining Company* is producing 300 tons per day of lead-zinc-silver ore from its Horntels orebody at its *Copper Canyon* mine south of Battle Mountain, Nevada. The recently completed zinc flotation circuit is making a satisfactory grade zinc concentrate according to Robert H. Raring, vice president and general manager. Separate marketing of zinc adds materially to the economic return on concentrate. The Copper Canyon mill is also accepting lots of custom lead-zinc ore from adjoining mines. Lead concentrate is shipped to the Tooele, Utah smelter of *International Smelting and Refining Company* and the zinc concentrate is also marketed through International.

Westvaco Company has taken over eight claims 45 miles south of Battle Mountain, Nevada. Extensive drilling operations are said to be under way to determine the extent and grade of a large deposit of barite. The deposit was discovered last summer by G. R. Dyer of Tonopah, and W. G. Lee and Lee Hand of Copper Basin.

Goldfield Consolidated Mines Company of Goldfield, Nevada, has acquired three scheelite claims and two mill sites on a lease and purchase option basis at a cost of $80,000. The tungsten claims were those of Mr. and Mrs. George D. Mathewson of Denio, Nevada; the mill properties are owned by the Mathewsons and Mrs. Katherine Crew of Stockton, California and associates. Vern K. and Leona Cannon of Carson City, Nevada, are named as co-lessors on the

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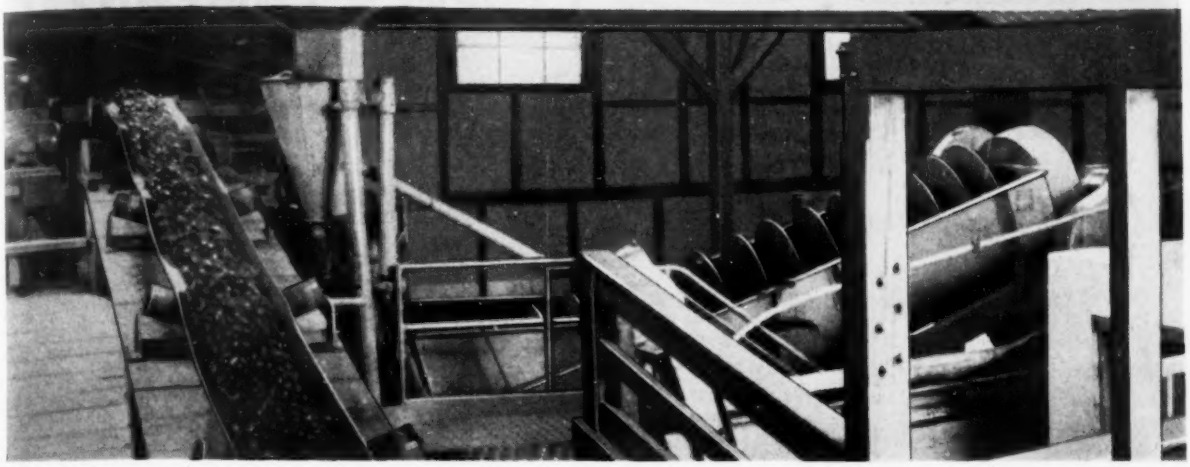

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FEED	PRODUCT	ASSAY	DISPOSITION OF MIDDLING	COMPANY	DATE OF INSTALLATION
R.O.M. Coal (Bituminous) 7" top size	Feed Float Coal Middling Refuse	10.28% ash 6.08% ash 25.44% ash 70.57% ash	salable product	Crystal Block Coal & Coke Co.	1951
Coal (Jig Middling) (Bituminous) 1½" top size	Feed Float Coal Middling Refuse	62.3% ash 27.5% ash 40.7% ash 78.0% ash	diverted to refuse	U. S. Coal & Coke Co.	1949
Garnet 1" top size	Feed Tailing Middling Concentrate	no sample 2.8% garnet 32.9% garnet 91.5% garnet	recrushed & recycled to HMS	Barton Mines Co.	1948
Zinc ore 1½" top size	Feed Tailing Middling Concentrate	2.00% zinc 0.63% zinc 9.28% zinc 36.00% zinc	recrushed for flotation feed	Eagle Picher Mining & Smelting Co.	1946 *
Iron Ore (Mesabi) 1" top size	Feed Tailing Middling Concentrate	44.57% Fe 12.39% Fe 36.52% Fe 57.76% Fe	diverted to tailing	M. A. Hanna Co.	1951 *
Iron Ore (Alabama Red Ore) 4" top size	Feed Tailing Middling Concentrate	57.76% Fe *operations just started, no data available*	stockpiled for future treatment	Sloss-Sheffield Steel & Iron Co.	1951 *Pilot Plant

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tungsten claims. The company is the sole lessor of the Vicksburg and Pine Forest mill sites.

Grey Eagle Development Company is continuing work on its No. 6 tunnel near Beowawe, Nevada throughout the winter. Supplies have been stored at the property to insure continued operations despite storms which might block the access roads. The company is seeking to intersect lead-silver-zinc ore bodies at 400 feet below the upper workings. The tunnel was driven in part by earlier operators who suspended operations before they reached the vein. The Grey Eagle company drove a new drift 225 feet to where it intersected the old workings. The old drift will be widened and heightened. When the ore zone is reached, the tunnel is expected to be about 2,000 feet long.

NEW MEXICO

The *Navajo Uranium Company*, an important uranium-vanadium producer in Colorado and Utah, has completed the erection of a uranium-vanadium ore sampling plant at Shiprock, New Mexico. The company has leased the plant to the *United States Atomic Energy Commission* for use in sampling ore the Commission will purchase from mines on the Navajo Indian Reservation. Mines in the Lukachukai Mountains of northeastern Arizona are presently the most important Navajo Reservation mines and will furnish the greatest tonnage of ore to the new sampling plant. The new plant will make possible the mining of lower grades of ore on the reservation and is an important step toward increasing uranium output on the Colorado Plateau. The new plant was designed and built under the supervision of G. R. Kennedy, general manager of the Navajo Uranium Company.

G. R. Griswold of Albuquerque, New Mexico, is reported to be repairing shafts of the *Benton* mine near Dolores, New Mexico, in the Ortiz Mountains. The work is part of an exploratory operation at the gold producer.

The *York Mining Company*, Albuquerque, New Mexico, has been incorporated in New Mexico with an authorized capital of $500,000. The company plans to put its 160-acre property in Socorro county into production. Initial plans call for core drill proving and underground development of ore bodies. Grover C. York is president.

The *Great Western Mining Company* is operating its mica mill at Mora, Mora county, New Mexico, and producing from 8 to 10 tons of scrap mica per day. Pegmatite is mined in an open pit and trucked to the mill where the mica is recovered. John Haberl of Las Vegas, New Mexico, is now in charge of operations and Porfirio Anaya is mine foreman.

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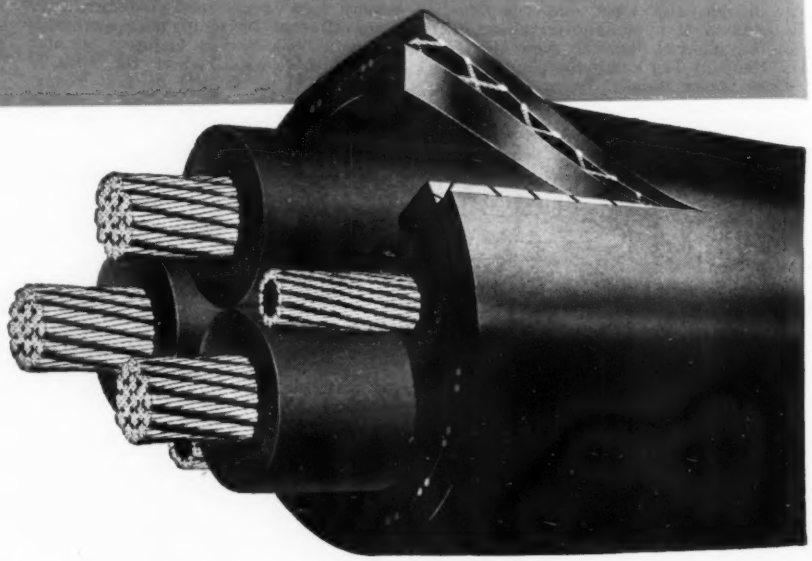

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Improvements Planned For Minnesota Iron Ore Docks

An extensive program of remodeling and renovation which will cost more than $2,000,000 is planned for the Duluth-Superior and Two Harbors ore docks this winter. The Duluth , Missabe & Iron Range, Great Northern and Northern Pacific Railway Companies will all have a part in the program.

About three-quarters of the total estimated expenditure will be by the D.M. & I.R. in remodeling its No. 1 dock at Two Harbors. Changes there are necessary to facilitate the loading of new and larger ore carriers now being constructed. Some of these new vessels are expected to be in service next season. Improvements planned at the No. 1 dock include widening of pocket doors from 5 feet to 11 feet, eliminating present restricting corners, longer and wider spouts, and new and heavier machinery to handle doors and spouts. The contemplated changes are expected to make No. 1 the fastest loading dock on the Great Lakes.

The Great Northern and Northern Pacific Railway Companies will carry on repairs and improvements at their Allouez docks. Next season, too, the Great Northern will use Diesel engines for switching at Allouez and on the docks. It will also have more Diesels on the long haul from mines to docks. Two gantry cranes will be erected with a "shaker" attached to loosen wet or sticky ore from cars and into the pockets. All the improvements are designed to expedite the transfer of ore from ore cars to pockets and to ore boats.

The *Michigan State Conservation Department* reports that the *Jones and Laughlin Ore Company* has relinquished its uranium exploration and mining lease issued about 18 months ago. It was the first uranium lease ever issued by the state and covered 80 state-owned acres in Baraga county. The company advised the state department that its exploration program did not uncover any uranium deposits of commercial value. Two other exploratory leases remain in effect. Both are held by J. E. Leitch and Thad D. Isham of Owosso, Michigan, and cover 160 acres in Dickinson county, about 16 miles northeast of Iron Mountain.

Calumet & Hecla Consolidated Copper Company's earnings decreased from $1.86 per share in 1950 to between $1.15 and $1.25 per share in 1951. The company's zinc operations improved in 1951. Explorations in the Wisconsin-Illinois zinc-lead district have resulted in discovery of additional ore reserves. These activities are presently being carried on under a cost-sharing contract with the government.

Present plans of the *White Pine Copper Company* for developing the *White Pine* property in Michigan, call for an operation of 10,500 tons daily and 3,750,000 tons annually, to produce 70,000,000 to 75,000,000 pounds of copper. Mining will be by conventional room and pillar method; transportation of ore to the surface by belt conveyor. Beneficiation is said to be comparatively flat lying, dipping from 6 to 8 percent over the greater portion, and varying from 8 to 15 feet in thickness. The prime contractor for the project is *Turner Construction Company;* R. C. Wilson and C. N. Hernandez will be in charge. White Pine is a subsidiary of *Copper Range Company*. The DPA has granted a certificate of necessity to write-off 75 percent of the first $30,842,000 profits, or $23,131,500. It may write-off 55 percent of the next $10,000,000 profits, or $5,500,000.

The *MacArthur Mining Company* has received $45,000 from the DMPA to expand zinc production at its property near Baxter Springs in Cherokee county, Kansas. The company will use the money to double present production of 325 short tons of ore per day to 650 tons. This will result in the production of 500 tons of zinc concentrates per month. The firm will repay the loan at the rate of $16 on each of the first 250 tons of concentrate produced each month until the advance is liquidated. The advance also carries the usual 4 percent interest per annum. The government has agreed to buy up to 1,500 tons of slab zinc at 17.50 cents per pound if the company cannot sell it on the market.

Certificates of necessity for accelerated tax amortization were approved by the DPA to several eastern companies. *Republic Steel Corporation*, New York, applied for a rapid write-off on $259,000 for iron ore in New York; the entire amount was eligible with a 65 percent certificate. *Wah Chang Corporation*, Glen Cove, New York, applied for and received a write-off for $53,160 for tungsten at a rate of 60 percent. *Woodward Iron Company*, Woodward, Alabama (home office) received approval for $161,682 out of $810,692 at a rate of 65 percent.

The exhaustion of high-grade iron ores to a depth 700 feet, coupled with the prohibitive cost of deeper development, has lead *Hanna Coal & Ore Corporation* to close its iron ore mine and mill at Degrasse, New York. On the company's payroll were 430 miners and 117 mill and shop workers.

Brush Beryllium Company of Luckey, Ohio, will begin construction of a new beryllium-copper-alloy plant shortly. It is expected to be in operation by August, and will produce commercial beryllium-copper-alloy ingots for instrument springs, electrical devices, and similar equipment. The firm's present reduction plant operates exclusively for the *U. S. Atomic Energy Commission*. The new fa-

WISCONSIN LEAD-ZINC MINE REOPENS

A 70-year-old lead-zinc mine near Mifflin, Wisconsin, has been reactivated and is now producing about 250 tons of ore a day. Operated by Mifflin Mining, Inc., the mine is located on a 1,000-acre lease, 3½ miles northwest of Mifflin. An International TD-9 tractor, equipped with a one-yard front-end shovel like the one above, loads ore into a truck a quarter of a mile underground. A crushing plant has already been installed at the mine and a flotation plant will be moved from Mifflin to the mine site.

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cility will be built with the aid of an $800,000 *Reconstruction Finance Corporation* loan.

Total production of primary aluminum in the United States during 1951 increased almost 17 percent above 1950 figures. Output would have been even higher except for power shortages in the northwest and southeast which curtailed production during the late summer, reports Donald M. White, secretary of the *Aluminum Association*. Since the outbreak of hostilities in Korea, increases in primary aluminum capacity total 1,500,000,000 pounds. About 1,100,000,000 pounds of this expansion will be in new plants and 400,,000,000 in existing plants. About 300,000,000 pounds of the 1,500,000,000 scheduled new capacity came into operation in 1951; an additional 800,000,000 pounds is expected to come in during 1952, and the remaining 400,000,000 pounds in 1953. Included in the expansion program are six new aluminum production plants. Two will be in the northwest and the other four in the south.

IRON RANGES

The DPA awarded five certificates of necessity to *Cleveland-Cliffs Iron Company* authorizing fast amortization on $1,689,750. The company was allowed to write off 45 percent of $40,000 worth of iron ore facilities at Ishpeming, Michigan, and Nashwauk, Coleraine, and Hibbing, Minnesota. Other awards covered *Oliver Iron Mining Company*, Duluth, Minnesota, 50 percent of $4,785,000, iron ore; *Interstate Iron Company*, five certificates authorizing 65 percent on a total of $3,695,171 for facilities to produce iron ore. One certificate covers a facility at Buhl, Minnesota; two cover facilities at Calumet, Minnesota; and two are for facilities in Itaska county, Minnesota.

Iron ore shipments from the Lake Superior district during 1951 were the largest in history—96,550,000 gross tons. This includes about 7,500,000 tons in all-rail shipments, as well as that on the lakes. The old record of 92,076,781 tons was set in 1942. At the end of the Great Lakes navigation season, freighters had hauled 89,092,012 gross tons of ore, a peacetime record in itself. The total in 1950 was 78,205,592; the previous peacetime record was 82,937,192 set in 1948.

With the completion of work at the *Wacootah* mine at Mountain Iron Village, Minnesota, the *Wheeling Steel Company* is terminating its mining operations on the Mesabi Range. Charles R. Emerson and Edwin C. Johnson—general superintendent and assistant general superintendent—maintained the Virginia office of the company until January 1 of this year. The Wacootah was opened in 1906 by the *Pitt Iron Mining Company*, a Wheeling subsidiary, and operated by them until 1930. Wheeling Steel has operated the company since 1931. The mine has shipped a total of about 7,500,000 tons of ore. *Pacific Isle Mining Company* has taken over the mine, buildings, and equipment, along with Wheeling's other Mesabi Range mineral interests. No plans for the future have yet been announced.

METAL AND MINERAL MARKETS

METALS

December 20, 1951

COPPER:	**Electrolytic.** Delivered F.o.b. cars, destination U.S.A.	24.50¢
	Lake. Delivered, destinations U.S.A.	24.625¢
	Foreign Copper. New York	27.50¢
LEAD:	**Common Grade.** New York	19.00¢
	Foreign lead. New York delivery. (Import price ceiling)	19.00¢
ZINC:	**Prime Western.** East St. Louis	19.50¢
	Foreign zinc. East St. Louis delivery. (Import price ceiling)	19.50¢
ALUMINUM:	**Primary 30 pound Ingots (99% plus).** F.o.b. shipping points	19.00¢
ANTIMONY:	**Bradley Mining Co.'s Elk Brand 99.5%.** F.o.b. Cascade, Idaho	50.00¢
	Lone Star Brand. F.o.b. Laredo, in bulk	50.50¢
BISMUTH:	(In ton lots) price per pound	$2.25
CADMIUM:	**Sticks and bars.** 1 to 5 ton lots	$2.55
COBALT:	**97-99%,** keg of 550 pounds	$2.40
MAGNESIUM:	**Ingots (99.8%).** F.o.b. Freeport, Texas	24.50¢
MERCURY:	**Flasks.** Large lots, New York	$209.00-$212.00
NICKEL:	**"F" Ingots (5 pounds).** F.o.b. refinery, Port Colburne, Ontario	56.50¢
TIN:	**Grade A Brands.** New York	103.00¢
TITANIUM:	**(98.5%).** F.o.b. Beverly, Massachusetts	$7.00
GOLD:	United States Treasury price	$35.00 per ounce
SILVER:	**Newly mined domestic.** United States Treasury price	90½¢ per ounce
	Foreign. Handy & Harman	88.00¢ per ounce
PLATINUM:		$90.00-$93.00 per ounce

ORES AND CONCENTRATES

BERYLLIUM ORE:	10 to 12% BeO. F.o.b. mine, Colorado	$35.00 per unit
CHROME ORE:	F.o.b. railroad cars eastern seaports. Long tons dry weight.	
	African (Rhodesian). 48% Cr_2O_3. 3 to 1 chrome-iron ratio	$43.00-$44.00
	African (Transvaal). 48% Cr_2O_3.	$34.00-$35.00
	Turkish. 48% Cr_2O_3. 3 to 1 chrome-iron ratio	$52.00-$53.00
	U. S. Government ore purchase depot Grants Pass, Oregon, Base price, lumpy ore, $115.00; fines and concentrates $110.00 for 48% Cr_2O_3 and a 3 to 1 chromium-iron ratio. Premiums for higher grade ore and for a ratio up to 3.5 to 1. Penalties for grades down to 42% Cr_2O_3 and a 2 to 1 ratio.	
IRON ORE:	Lake Superior. Per gross ton Lower Lake Ports.	
	Mesabi, Non Bessemer, 51.5% Fe	$ 8.30
	Mesabi, Bessemer, 51.5% Fe	$ 8.45
	Old Range, Non Bessemer	$ 8.55
	Old Range, Bessemer	$ 8.70
MANGANESE ORE:	**Metallurgical grade.** 46 to 48% Mn. Long ton unit	$1.10 to $1.18
	Chemical grade. 80% MnO_2. Per ton	$60.00
	Chemical grade, domestic, 70% MnO_2, F.o.b. mines	$45.00
	U. S. Government ore purchase depot Deming, New Mexico. Base price, $6.10 per long dry ton for 15% ore. Price increasing to $76.00 for 40% ore. Less $12.00 per long dry ton for milling. U. S. Government purchase depot Butte, Montana. Base price, $6.05 per long dry ton for 12% ore. Increasing to $40.42 for 30% ore. U. S. Government purchase depot Phillipsburg, Montana. Base price, $6.43 per long dry ton for 15% ore. Increasing to $34.81 for 30% ore. (Montana ore must contain not less than 90% as carbonate).	
MOLYBDENUM CONCENTRATE:	90% MoS_2. F.o.b. Climax, Colorado. Per pound of contained molybdenum, plus cost of containers	$1.00
TUNGSTEN CONCENTRATE:	60% WO_3. Per short ton unit	$65.00
URANIUM ORE:	**Carnotite-Roscoelite.** F.o.b. purchase depot plus $0.06 per ton mile (maximum of $6.00), Rifle, Naturita, Uravan and Durango, Colorado; Salt Lake City and Monticello, Utah. Base price for 0.10% ore is $1.50 per pound and ranges to $3.50 per pound of contained U_3O_8 plus $0.75 per pound for each pound in excess of four pounds per short dry ton and an extra allowance of $0.25 per pound for each pound in excess of 10 pounds. A development allowance of $0.50 per pound is paid for all ores purchased.	
VANADIUM ORE:	**Carnotite-Roscoelite.** V_2O_5 content, up to 10 pounds, in uranium ore paid for at $0.31 per pound in ratio of 10 parts V_2O_5 to 1 part U_3O_8.	

NON-METALLIC MINERALS

BENTONITE:	**Minus-200-mesh.** F.o.b. Wyoming points. Per ton in carload lots	$12.50
	Oil Well grade. Packed in 100 pound paper bags	$14.00
FLUORSPAR:	**Metallurgical grade.** 70% effective CaF_2 content per short ton F.o.b. Illinois-Kentucky mines	$43.00
	Ceramic grade. Minimum CaF_2 content, 95%	$45.00
	Acid grade. 97% CaF_2	$60.00
PERLITE:	**Crude:** F.o.b. mine per short ton	$3.00 to $5.00
	Plaster grades. Crushed and sized. F.o.b. plants per short ton	$7.00 to $9.00
	Concrete grades. Crushed and sized	$6.00 to $8.00
	Oil Well Grades.	$6.00 to $9.00
SULPHUR:	**Long ton, F.o.b. Gulf Coast mines**	**$22.00**

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Black Maverick Mine

Continued from Page 45

During the trip the Indian seemed nervous and ill at ease. Two days later when the little party had reached a point on the western foothills directly opposite the four lofty peaks, the Yaqui became morose and refused to go any farther, or disclose any more information that would enable the Hardts to find the mine. Under the circumstances there seemed to be nothing else to do but abandon the search. Hardt now believes that they must have been very near the location when the Indian stopped and refused to go any farther.

Experience has proved that an Indian will refuse absolutely to take one directly to an old mine. He usually stops short when near the location and says "Buscalo," which in Spanish means, "Look for it!" A squaw took Ed Echieffelin of Tombstone fame to within a few hundred feet of the outcrop of the famous Vulture vein and told him to "Buscalo." He refused to take her advice and thereby lost a chance to add several million dollars to his fortune.

Yaqui Valentino died of a hemorrhage about a year after the fruitless expedition with the Hardts. The specimen of rich ore, which he had carried until his death, was ground in a mortar and panned out by Phil Fogle of Tempe. He recovered a pill bottle almost full of coarse gold.

Hardt and his wife hope some day to have another try at the "Black Maverick." They may not find the mine, but they can look from their old stamping grounds out upon a beautiful lake that dances in the noon-day sun, and watch the crystal waters of the Salt and Verde Rivers as they tumble down through the rocky gorges.

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INDEX OF ADVERTISERS

Agence Miniere & Maritime, U.S.A. 68
Allen-Sherman-Hoff Pump Co. Inside Front Cover
Allis-Chalmers Mfg. Co. (Gen. Machinery Div.) 52
Allis-Chalmers Mfg. Co. (Tractor Div.) 20, 21
Allison Steel Mfg. Co. 102
Alloy Steel & Metals Co. 4
American Cyanamid & Chemical Corp. 24
American Manganese Steel Div. (Am. Brake Shoe Co.) 55
American Mine Door Co. 57
American Potash & Chemical Corp. 13
American Rubber Co. 78
American Smelting & Refining Co. 76
American Zinc, Lead & Smelting Co. 92
Anaconda Wire & Cable Co. . 94
Arizona Testing Laboratories 99

Baldwin-Lima-Hamilton Corp. 69
Beach & Co. 99
Behre Dolbear & Co. 68
Bemis Bro. Bag Co. 57
Bennett's Chemical Laboratory 99
Black & Deason 99
Boyles Bros. Drilling Co. .. 48
Bunker Hill & Sullivan Mining & Concentrating Co. 92
Business Men's Clearing House 103

Card Iron Works, C. S. 54
Caterpillar Tractor Co. 11
Chicago Pneumatic Tool Co. . 70
Christensen Diamond Products Co. 93
Collins, Glenville A. 68
Colorado Assaying Co. 99
Colorado Fuel & Iron Corp. .. 13
Colorado Iron Works 91
Columbia Steel Co. 46
Columbian Steel Tank Co. 88
Consolidated Pneumatic Tool Co. 70
(World Mining)
Cummins Engine Co. 12
Custom Assay Office 99

Darien Corp. 102
Deister Concentrator Co. 68
Denver Equipment Co. 50
Denver Fire Clay Co. 60
Detroit Diesel Div. (General Motors Corp.) 83
Diamond Drill Contracting Co. 100
Differential Steel Car Co. 82
Dings Magnetic Separator Co. 18
Dorr Co. 2
du Pont de Nemours & Co., Inc. (Explosives Div.) 64
du Pont de Nemours & Co., Inc. (Cordura Div.) 85
Edwards Company, E. H. 1

Eimco Corp. Outside Front Cover
Emsco Concrete Cutting Co. . 76
Euclid Road Machinery Co. Inside Back Cover

Federal Pipe & Tank Co. ... 101
Florence Machinery & Supply Co. 101

Gardner-Denver Co. 16
General Electric Co. 74, 75
Gilmore, R. L. 99
Golden Cycle Corp. 102
Goodall Brothers 99
Goodman Mfg. Co. (Moncha Div.) 59
(World Mining)
Gould Co., H. W. 93
Greenwood, Capt. 101

Hanks, Inc., Abbot A. 99
Hardinge Co. 60
Harnischfeger Corp. 61
Hartley, Gerald B., Jr. 99
Hawley & Hawley 99
Hewitt-Robins, Inc. 80, 81

International Smelting & Refining Co. 92

Jeffrey Mfg. Co. 63
Johnson, Herbert Banks 68
Joy Mfg. Co. 8, 9

Kingaard, Alexander R. 68
Kirk Co., Wallace E. 103

Le Roi Co. 5
Leschen & Sons Rope Co. 87
Le Tourneau, Inc. R. G. .. 14, 15
Link-Belt Co. 62, 63
(World Mining)
Lintz, Mark 99

Mace Co., The 57
Magma Copper Co. 92
Marion Power Shovel Co. 64
(World Mining)
McNeil, Clayton T. 99
Merrick Scale Mfg. Co. 100
Merrington, J. C. 101
Midwestern Machinery Co. .. 100
Mill & Mine Supply Co. 57
Miller, Arnold H. 99
Miller Machinery Co. 103
Mine Safety Appliances Co. . 90
Mine & Smelter Supply Co. . 58
Minerals Laboratory 99
Moos, Stanley M. 99
Morris Machine Works 84
Morse Bros. Machinery Co. . 102
Murphy, F. M. 99

National Malleable & Steel Castings Co. 3
New World Exploration, Research & Development Corp. 68
Nordberg Mfg. Co. 86
Northern Blower Co. 17

O'Neil Co., A. J. 101
Osmose Wood Preserving Co. of America 77

Pacific Foundry Co., Ltd. 13
(World Mining)
Pacific Pipe Co. 88
Peale, Rodgers 99
Phelps Dodge Refining Corp. 98
Pierce, Roger V. 68
Piggott Projects 99

Resisto-Loy Co. 88
Rocks & Minerals 101

Salem Tool Co. 56
Smith, Cloyd M. 68
Smith-Emery Co. 99
Smith, Paul F. 101
Southwestern Geological Service 99
Sprout, Hill Corp. 103
Stearns Magnetic Mfg. Co. .. 97
Stephens Adamson Mfg. Co. 7
Stevens Co., W. H. 99
Stewart Mill Inside Front Cover
(World Mining)

Tamping Bag Co. 100
Taylor Wharton Iron & Steel Co. 62
Thew Shovel Co. 6
Timken Roller Bearing Co. .. 96
Traylor Engineering & Mfg. Co. 66

Udy, Marvin J. 68
United States Steel Co. 46
Universal Dredge Mfg. Co. .. 100

Van Waters & Rodgers, Inc. . 100
Vulcan Iron Works 93

Walvoord Co., O. W. 99
Wedge Wire Corp. 98
Western Machinery Co. 10
Western Rock Bit Mfg. Co. .. 59
Westinghouse Electric International 1
(World Mining)
Wilfley & Sons, A. R. Outside Back Cover
Wilfley, Clifford R. 99
Wilson, Clyde H. 99
Wilson, Glenn B. 103
Wolf, Harry J. 99
Wood Assaying Co., Henry E. 99
Wright, Lawrence B. 99

Yuba Mfg. Co. 57

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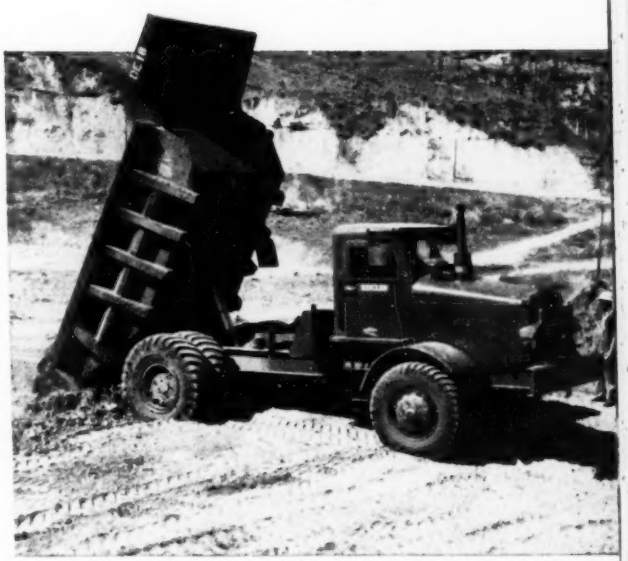

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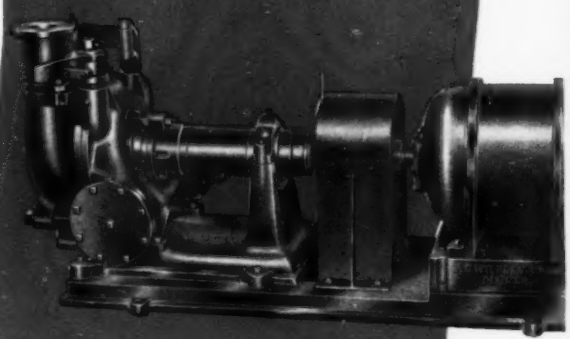

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